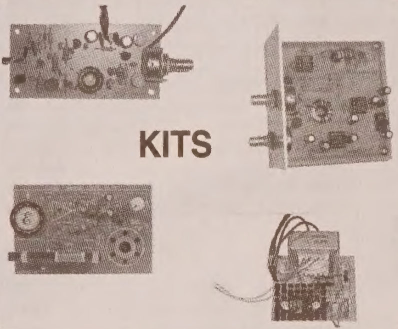
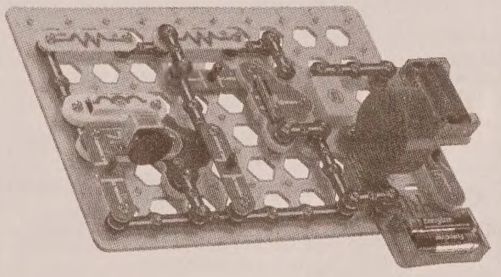
OCEAN STATE ELECTRONICS

OVER 100
NEW PRODUCTS ADDED SINCE OUR 2003 CATALOG


KITS

NOW STOCKING THE WORLD FAMOUS SNAP CIRCUITS KITS

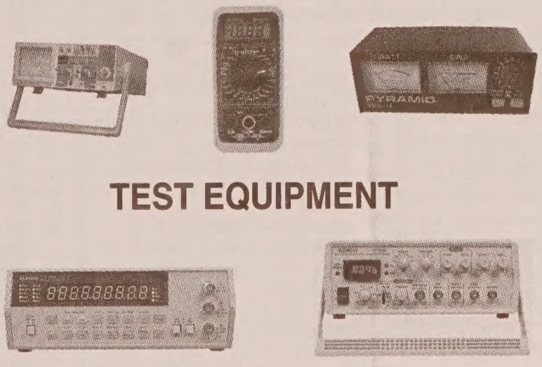

SEE PAGE 25

TOOLS

METAL DETECTORS

PAGE 119

COMPONENTS


TEST EQUIPMENT

OCEAN STATE ELECTRONICS
6 INDUSTRIAL DRIVE
P.O. BOX 1458
WESTERLY, RI 02891
800-866-6626
401-596-3080 FAX 401-596-3590

2004

Be Sure To Visit Our Website
www.oselectronics.com
Hundreds of additional products not shown in our catalog.

e-mail us at
ose@oselectronics.com

CATALOG NO. 0204A

INDEX PG. 2

INDEX

It is always exciting for us when a new edition of our catalog comes out. Usually it means new products added. This year is no different. We have continued the tradition of bringing you the best new and exciting products for the electronic hobbyist, professional, school and OEM. In fact we have added over 500 new products in 2003. Our new 2004 catalog shows about 100 of these new products. To see the rest of them you will have to visit the best website on the net at www.oselectronics.com . We also continue the tradition of bringing you the best customer service in the industry. You will never have to push a million buttons to get through to someone. When you call us you will always get a live person to talk to. Our staff are not just a salespeople, but hobbyist's, ham's, and engineers who use or have used the items shown in our catalog. Our people have many years of experience behind them. Once again, to all our prior customers, a big Thank You for making Ocean State Electronics your number one source. To those who are not yet customers, give us a chance. We guarantee you will not be disappointed.

ITEM ... PAGE

A

- AC/DC ADAPTERS ... 17
- AC LINE CORDS ... 115
- AC CHASSIS RECEPTACLE ... 115
- ALIGNMENT TOOLS ... 62
- ALLIGATOR CLIPS ... 8
- ANTENNAS
  - BALUNS ... 47
  - CENTER CONNECTORS ... 47
  - INSULATORS ... 47
- ANTI-STATIC WRIST STRAP ... 63
- AUD/VID SELECTOR SW. ... 118

B

- BANANA PLUGS/JACKS ... 108
- BAR GRAPH DISPLAYS ... 69
- BATTERY HOLDERS ... 103
- BEADS ... 86
- BINDING POSTS ... 108
- BOOKS ... 120
- BREADBOARDS ... 20
- BRIDGE RECTIFIERS ... 77
- BUZZERS ... 102-103

C

- CABLE/WIRE ... 46-47
- CABLE CLAMPS ... 100-101
- CABLE TV ACCESSORIES ... 116
- CAPACITANCE METER ... 4
- CAPACITOR SUB. BOX ... 22, 65
- CAPACITORS
  - CERAMIC DISK ... 92
  - DOOR KNOB Website
  - ELECTROLYTIC ... 91
  - FEED THRU ... 93
  - MONOLYTHIC ... 92
  - MYLAR/POLYESTER ... 90
  - POLYSTYRENE ... 93
  - SILVER MICA ... 93
  - TANTALUM ... 93
  - TRIMMERS ... 96
  - VARIABLE ... 94-95
- CENTRONICS CONNECTORS ... 116
- CERAMIC FILTERS ... 103
- CHASSIS PUNCH SET ... 65
- CHEMICALS ... 66
- CIRCUIT BREAKERS ... 115
- CLAMP ON METERS ... 6
- CLOCK OSCILLATORS ... 68
- COAX STRIPPERS ... 65
- COAXIAL CABLE ... 46
- COAXIAL SEAL ... 66
- CODE KEY ... 113
- CODE PRACTICE OSCILLATORS ... 113
- COIL FORMS ... 85
- COILS AND CHOKES ... 89,102
- COMPONENT TESTERS ... 4
- CONNECTORS
  - ADAPTERS
  - AUDIO ... 105
  - BANANA ... 108
  - BLADE TYPE(Jones) ... 109
  - BNC ... 106
  - CATV ... 116
  - CENTRONICS ... 116
  - DIN ... 108
  - D-SUB MINI ... 116
  - LOCKING ... 116
  - MULTI-PIN MOBILE ... 108
  - N-STYLE ... 107
  - RCA ... 105
  - STEREO ... 105
  - UHF ... 107
- COPPER CLAD PC BOARDS ... 56
- COTTON SWABS ... 64
- CRYSTAL SOCKETS ... 68
- CRYSTALS ... 68

ITEM ... PAGE

D

- DIAL DRIVE CABLE ... 85
- DIGITAL MULTIMETERS ... 4-5
- DIGITAL TRAINERS ... 18-19
- DIODES ... 77
- DIP HEADER PLUGS ... 88
- DRILL BIT SETS ... 56
- DRY TRANSFER LETTERING ... 52
- DUMMY LOADS ... 113

E

- EAR PHONES, CRYSTAL ... 117
- ENCLOSURES/CHASSIS ... 81
- EXPERIMENTER PRODUCTS ... 79, 102-103

F

- FAHNESTOCK CLIP'S ... 85
- FAN GUARDS ... 97
- FANS ... 97
- FEET ... 101
- FERRITE BEADS ... 86
- FERRITE RODS ... 86
- FIBER OPTICS KIT ... 44
- FISH PAPER ... 66
- FOAM CLEANING SWABS ... 64
- FREQUENCY COUNTERS ... 9
- FUNCTION GENERATORS ... 10
- FUSE BLOCKS ... 115
- FUSE CLIPS ... 115
- FUSE HOLDERS ... 115
- FUSES ... 115

G

- GLASS CLOTH TAPE ... 86
- GRID CAPS ... 85
- GROMMETS ... 101

H

- HAMMOND ENCLOSURES ... 81
- HARDWARE ... 100-101
- HEADPHONES ... 117
- HEAT GUNS ... 66
- HEAT SHRINK TUBING ... 66
- HEAT SINKS ... 84
- HEAT SINK COMPOUND ... 84
- HOOK-UP WIRE ... 46

I

- IC SOCKETS ... 88
- INDICATORS, NEON ... 114
- INSULATORS ... 47
- INTEGRATED CIRCUITS
  - 4000 ... 76
  - 7400 ... 74
  - 74LS ... 75
  - EPROMS ... 76
  - LINEAR ... 78
  - MICROPROCESSOR ... 76
  - MISCELLANEOUS ... 76, 79
  - MIXER, MINI-CIRCUITS ... 80
  - PAL'S ... 76
  - RAMS ... 76
- INVERTERS ... 17

J

- JUMPER TEST CORDS ... 8

K

- KITS ... 7, 11, 15, 18-19, 22-45
- KNIFE SET ... 64
- KNOBS ... 99

L

- LAMPS, MINIATURE ... 114
- LCR METER ... 4
- LED BAR GRAPHS ... 69

ITEM ... PAGE

- LED'S ... 69
- LED MOUNTING HARDWARE ... 69
- LOGIC PROBES ... 7
- LOOP-STIK ANTENNA ... 89

M

- MAGNET WIRE ... 46, 87
- MAGNIFIERS ... 62, 120
- METAL DETECTORS ... 119
- MICROPHONE ACCESSORIES ... 117
- MICROPHONE ELEMENTS ... 117
- MINI-CIRCUITS ... 80
- MULTIMETERS ... 4-5

N

- NIBBLING TOOL ... 65

O

- OPTO ISOLATORS ... 76
- OSCILLOSCOPE PROBES ... 12
- OSCILLOSCOPES ... 12

P

- PANAVISE ... 67
- PANEL BEARING ... 98
- PANEL INDICATOR LAMPS ... 114
- PANEL METERS ... 97
- PC BOARDS & SUPPLIES ... 48-56
- PHOTOCELLS ... 88
- PLASTIC POLISH ... 120
- PLUGS & JACKS ... 104-105, 108
- POTENTIOMETERS ... 72
- POWER SUPPLIES ... 13-16
- PROJECT LABS ... 26-27
- PROTO-BOARDS ... 48

Q

- Q-DOPE ... 87
- QRP DUMMY LOAD ... 113

R

- RELAYS ... 88-103
- RESISTOR SUBSTITUTION BOX ... 65
- RESISTORS ... 70-71
- RESONATORS, CERAMIC ... 68
- RF MODULATOR ... 118
- ROBOT KITS ... 38

S

- SEMI-CONDUCTOR MOUNTING HARDWARE ... 84
- SHAFT ACCESSORIES ... 98
- SIGNAL GENERATORS ... 10
- SIGNAL INJECTER/TRACER ... 24
- SOFTWARE, PCB ... 53
- SOLAR CELLS ... 112
- SOLDER/ACCESSORIES ... 61, 120
- SNAP CIRCUITS ... 25
- SPACERS ... 101
- SPEAKERS ... 117
- SWITCHES ... 102, 110-111
- SWR/POWER METERS ... 113

T

- TAPE ... 66
- TEMPERATURE METER ... 6
- TERMINAL BLOCKS ... 109
- TERMINAL STRIPS ... 109
- TEST EQUIPMENT ... 4-7, 9-12, 22
- TEST LEADS ... 8
- TEST PRODS ... 8, 108
- TOOLS ... 57-67
- TOROIDS ... 86-87
- TRANSDUCERS ... 103

ITEM ... PAGE

- TRANSFORMERS
  - AF ... 117
  - IF ... 103
  - POWER ... 114
  - WALL ... 17
- TRANSISTOR SOCKETS ... 84
- TRANSISTOR TESTER ... 22
- TRANSISTORS
  - FET'S ... 82
  - HEX FET'S ... 82
  - POWER ... 82
  - RF ... 82
  - SMALL SIGNAL ... 83
  - TIP ... 82
- TRIGGER COIL ... 103
- TRIMMER POTENTIOMETERS ... 72-73
- TUBES ... Website
- TUBE SOCKETS ... 85
- TURNTABLE, STEREO ... 118

V

- VARACTOR DIODES ... 76
- VARIABLE CAPACITORS ... 94-96
- VARIAC ... 16-17
- VERNIER DIALS ... 99
- VERNIER REDUCTION DRIVE ... 99
- VFO KITS ... 39
- VISES, PANAVISE ... 67

W

- WASHERS
  - FIBER ... 101
  - NYLON ... 100
  - STEEL ... 100
- WATT METER ... 113
- WIRE/CABLE ... 46-47
- WOODEN TOYS ... 38

X

- XENON FLASH TUBE ... 103

Z

- ZENER DIODES ... 77

Ocean State Electronics carries products from over 300 different manufacturer's. In addition to the items listed in our catalog, we have hundreds of more products available. Many of the products not shown in our catalog are available on our website. Please visit **www.oselectronics.com** If the product(s) you are looking for is not shown on our website please call us toll free at 1-800-866-6626

Copyright 2004. All rights reserved.
No portion of this publication, whether in whole or in part, can be reproduced without the express written consent of Ocean State Electronics.

TERMS AND CONDITIONS

Minimum Order
$10.00 is the minimum order before shipping charges.

Payment
We accept Visa, Mastercard, and American Express. No added surcharges. You may pay by check or money order in U.S. funds (drawn on a U.S. bank). Please be aware that orders paid by check will be held until check clears the bank. This can be any where from 2-7 days depending on your location.

C.O.D.
Payment must be by cash, money order or company check. An additional charge of $10.00 must be added to the shipping charges.

Net 30
Net 30 accounts are granted automatically to schools, cities, towns, government agencies and well known companies. Other companies may apply for net 30 terms by submiting the appropriate credit references. Our terms are Net 30 from invoice date, strictly enforced. Accounts over 30 days will automatically be put on credit hold and are subject to late fees of 1.5% per month or 18% annum plus legal fees if necessary.

Hours
Our hours are Monday thru Friday 9:00 AM to 5:00 PM E.S.T. Closed Saturdays and Sundays. Hours subject to change.

Placing an Order
Orders may be placed via mail, phone, fax, or internet. Mail in orders address to: Ocean State Electronics, P.O. Box 1458, Westerly, RI 02891. Phone orders may be placed toll free during our business hours at 800-866-6626. Or you may fax your order. Fax to 401-596-3590. Our fax line is open 24 hours a day 7 days a week. Orders placed via the internet are on a secure server. It is very safe.

Technical Assistance
We have on staff two full time electronic engineers, one with an amateur extra class license. Almost 80 years combined experience in the field of electronics. They should be able to assist you even with the most technical of questions. They are also fully trained on all our products and can also take your order. All we ask is that if you call for technical help, please do not use the toll free order line. Please call on 401-596-3080 or if you like you may fax your question(s) at 401-596-3590 or write in with your question(s). Your question(s) will be answered promptly. Address all technical questions to our Technical Dept.

Quotations
We will be happy to quote on products not listed in the catalog, or quote on products needed in large quantities. For over the phone quotes please limit this to 8 or less items. Any large quotes we ask that you email or fax them to us. Please address any quotations to our Quotation Dept.. Your quote will be answered promptly.

Shipping (U.S. & Possessions)
Our fee for most orders shipped UPS ground in the continental U.S. is $7:00 (This may vary depending on the weight).The fee for orders shipped by US mail in the entire U.S., APO, FPO, and U.S. possessions is also $7:00. Orders going to Alaska or Hawaii are shipped by US mail. The fee for UPS shipment to Alaska or Hawaii is $20.00.
Expect your UPS ground delivery to take from 1-7 days depending on your location from the time the order is shipped. For quicker delivery request UPS next day, 2nd day, or 3rd day delivery. The fee for ups next day is $32.50, 2nd day is $17.50, and 3rd day is $14.00.
If your mail in order consists of heavy items such as power supplies, oscilloscopes, or cable on 500/1000 foot rolls, then include $15.00. Credit card and Net 30 orders will be billed actual amount.

Shipping (Canada & Oversea's)
We are pleased to do business with our international customers. Payment must be Visa or Mastercard. Canadian customers only may also use a postal money order. No personal checks or other money orders can be accepted even if it says "Drawn on a U.S. bank". Canadian customers mailing in an order, please include $16.00 unless order consists of items mentioned above. Then include 10% of order, but no more than $20.00. Oversea's etc. please include $25.00, unless order consists of items mentioned above. Credit card orders for all will be billed actual amount. All orders shipped to Canada and abroad are shipped by U.S. mail. Please be aware, some countries do not allow insurance. Ocean State Electronics shall not be responsible for items that may be lost in shipping to countries without insurance. If in doubt, check with your local post office.

Ordering Non-cataloged Items
Through our suppliers, we have access to literally tens of thousands of other items. So if the item you need does not appear in the catalog, please give us a call. Special ordered items are non-returnable and certain additional shipping fees may apply. Your Ocean State salesperson will be happy to discuss the details. Non catalog items we can get usually take between 1-3 weeks from time of order.

Back Orders
We attempt to stock all items listed in our catalog, flyers, or advertisements. However, from time to time, an item or items will be out of stock. If we only have one supplier for this item and they too are out of stock, delivery can sometimes be many weeks. Fortunately, most back orders are filled within 2 weeks or less. If you phone your order in and pay by credit card, we shall ship all items available from our stock within 24 hours and back order any item(s) not available. The line item total of this item must be $10.00 or more to be back ordered otherwise we will cancel it from the order and indicate the item(s) was out of stock and to reorder at a later date. We bill you for the back ordered item when it arrives and is going to be shipped. Mail in orders that we can fill from stock are shipped within 24 hours if paid by money order, credit card, or open account. Orders paid by personal check shall be held 2-7 days while check clears the bank. If a back order exists on your prepaid order we shall hold the order until complete for a maximum of three weeks. If you would like us to ship partial orders, cancel any back orders, and issue a refund or credit on your account please indicate this on your order. If not indicated, credit towards future order will be given.

Substitutions
We reserve the right to substitute a higher quality or equivalent part or product at our option unless you specify no substitutions at the time your order is place. This would occur if the part you are ordering is either out of stock, discontinued, or no longer being carried.

Pictures
Pictures in this catalog are in some instances only representative of an item. If the looks of the product is that critical then it may be wise to call your Ocean State Salesperson for more details.

Disclaimer
There are no express or implied warranties. Since seller cannot control the manner or use of its products after the sale, the seller will not be responsible for any consequential or indirect damages.

Prices and Product Availability
Prices and product availability in this catalog were current as of December 2003. However prices and availability are subject to change. We shall inform you at the time you place your order of any drastic price increases. Small price increases will be billed at the current new price.

Typographical Errors
Ocean State Electronics shall not be responsible for typographical errors.

Claims for Shortages
Claims for shortage, damage, or loss must be made with 7 days of receipt of order or claim will be disallowed.

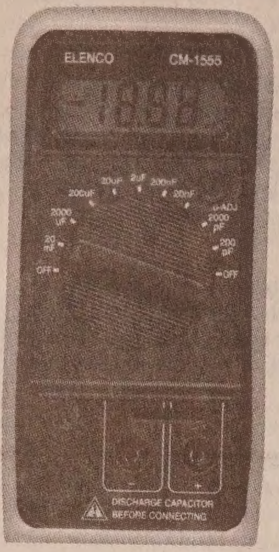
Returns
Due to the high cost of processing paperwork and labors involved, all returns will be subject to a minimum 15% restocking charge unless there was an error on our part or the product was defective. Absolutely no returns on books, software and videos. Tubes, or semiconductors that have been installed may not be returned. You must call first to receive an RGA number (returned goods authorization). This number must appear on the outside of the package being returned. We will refuse any package coming back to us that does not have the RGA number clearly marked on the outside. We recommend you ship the package back via UPS or insured mail. We shall not be responsible for packages sent without insurance. If you are returning the item for credit, we shall issue you a credit to your credit card if originally paid by credit card, or if order was paid by check or money order, we shall issue a refund check. Please allow 2-4 weeks for credit. Returns must be made within 30 days from invoice date.
Please include a copy of the invoice and state the reason for return.

PRIVACY POLICY
Our policy is simple. We never share, rent, or sell our customer information to anyone, **NEVER!!**

ELENCO **ELENCO**

COMPONENT TESTERS

Digital Capacitance Meter



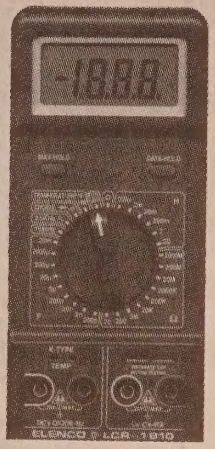
CM-1555..............$39.95

- Measures capacitors from .1pF to 20,000µF
- 3 1/2 Digit LCD readout with unit indicator
- Zero control for test lead compensation
- Banana jack and special insertion jack included
- Compact size with tilt stand and holster

SPECIFICATIONS

Range	200pF, 2,000pF, 20nF, 200nF 2µF, 20µF, 200µF, 2,000µF, 20,000µF
Resolution	.1pF, 1pF, 10pF, 100pF, 1nF, 10nF, 100nF, 1µF, 10µF
Accuracy	1/2% 200pF - 200µF range 2% 2,000µF range 4% 20,000µF range
Accessories	Test leads, Manual, 9V Battery included
Size:	2.7" W x 6" L x 1.2" D

Digital LCR Meter



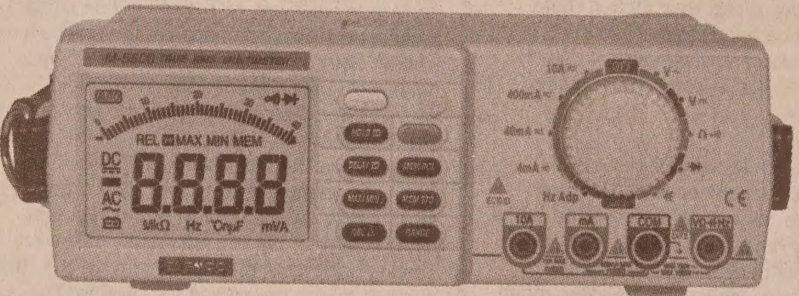
LCR-1810...........$99.95

- Capacitance .1pF to 20,000µF
- Inductance 1µH to 20H
- Resistance .01Ω to 2000MΩ
- Temperature -20°C to 750°C
- DC Volts 0 - 20V
- Frequency up to 15MHz
- Diode/Audible Continuity Test
- Signal Output Function
- 3 1/2 Digit Display

SPECIFICATIONS

Capacitance Accuracy	200pF, 2nF, 20nF, 200nF, 2µF, 20µF, 200µF, 2000µF, 20MµF ±2%	Resolution .1pF
Inductance Accuracy	200µH, 2mH, 20mH, 200mH, 2H, 20H ±5%	Resolution .1µF
Resistance Accuracy	20Ω, 200Ω, 2kΩ, 20kΩ, 200kΩ, 2MΩ, 20MΩ, 200MΩ, 2000MΩ ±0.3%	Resolution .01Ω
Temperature	-20° - 500°C ±2% 500° - 750°C ±3%	
Frequency	Autoranging up to 15MHz ±10%	
DC Volts	0 - 20VDC +2%	
Accessories	Test leads, Manual, 9V Battery included	
Size:	3.5" W x 6.8" L x 1.4" D	

BENCH TOP DIGITAL MULTIMETER



Features

- Large 3 3/4 Digit, 3999 Count LCD Backlighted Display.
- Auto/Manual Ranging.
- Capacitance & Frequency.
- Data Hold, Min./Max.
- True rms. / Relative Display.
- Storage Data Display Recall.
- 42 Segment Bargraph Display.
- Diode/Continuity Test.
- AC or DC Power Source.

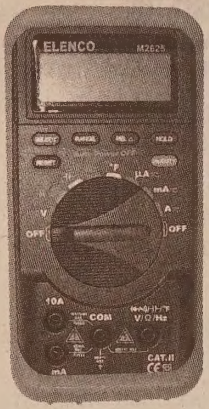
Specifications

AC + DC Volts Accuracy	400mV (DC only), 2V, 20V, 200V, 1000V, 750VAC (True rms) 0.5% rdg ±5% DC, 0.8% rdg ±5% AC	Resolution 0.1mV (DC), 1mV (AC)
AC + DC Current Accuracy	4mA, 40mA, 400mA, 10A 0.8% rdg DC, 1.5% rdg AC	Resolution 1µA
Resistance Accuracy	400Ω, 4kΩ, 40kΩ, 400kΩ, 4MΩ, 40MΩ 0.5% rdg ±5%	Resolution 0.1Ω
Capacitance Accuracy	4nF, 40nF, 400nF, 4µF, 40µF 2% rdg ±5%	Resolution 1pF
Frequency Accuracy	100Hz, 1kHz, 10kHz, 100kHz, 1MHz 0.1% ±4%	Resolution 0.01Hz
Power	120VAC, DC (9V Battery & 6 "AA", not included).	
Dimensions & Weight	3 1/4" (H) x 9 5/16" (W) x 9" (D)	2 lbs. 11 oz.

Model M-5500............$129.95

ELENCO DIGITAL MULTIMETERS ELENCO

OUR BEST SELLING MULTIMETER



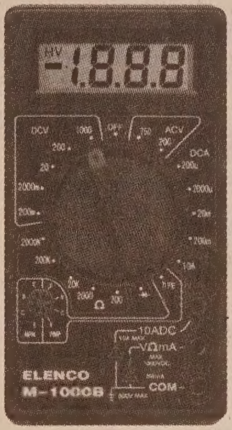
M-2625..........$39.95

- Auto ranging & manual ranging
- Frequency to 10MHz
- Capacitance to 100µF
- Audible Continuity
- 3-1/2 Digit LCD
- AC/DC Current to 10A

SPECIFICATIONS

AC + DC Volts Accuracy	400mV, 4V, 40V, 400V, 600V ±1%	Resolution .1mv-1v
AC + DC Current Accuracy	40µA, 400µA, 40mA, 400mA, 4A, 10A ±2%	Resolution .1µA-10mA
Resistance Accuracy	400Ω, 4kΩ, 40kΩ, 400kΩ, 4MΩ, 40MΩ ±1%	Resolution .1Ω-10kΩ
Frequency Accuracy	5Hz 10MHz Autoranging	
Capacitance Accuracy	40nF, 400nF, 4µF, 40µF, 100µF ±3.5%	Resolution 10pF to 100nF
Temperature Accuracy	-58˚F to 752˚F Autoranging ±1.5%	
Accessories	Test leads, Manual, 9V Battery included	
Size	2.75" X 6" L X 1" D	

COMPACT MULTIMETER

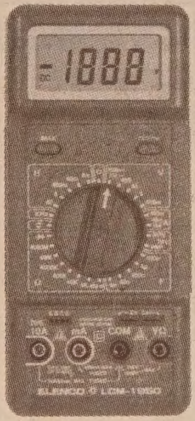


M-1000B..........$17.95

- 3-1/2 Digit LCD
- Transistor Test
- Diode Test
- Overload Protection
- Pocket Size
- Low Cost

SPECIFICATIONS

DC Volts AC Volts Accuracy Resolution Input Impedance	200mV, 2V, 20V, 200V, 1000V 200V, 750V DC 1/2%, AC 1.2% .1mV 1MΩ
DC Current Accuracy Resolution	200µA, 2mA, 20mA, 200mA, 10A ±1.2% rdg + 2 digits .1µA
Resistance Accuracy Resolution	200Ω, 2kΩ, 20kΩ, 200kΩ, 2MΩ ±1.2% rdg + 2 digits .1Ω
Accessories	Test leads, Manual, 9V Batteries included
Size	2.9" W x 5" L x 1" D



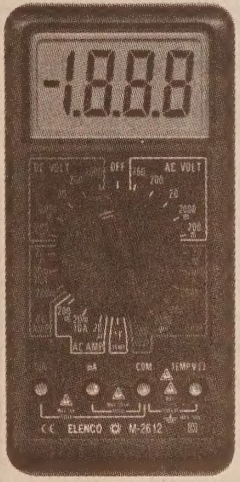
FULL FUNCTION DMM ALSO MEASURES INDUCTANCE, CAPACITANCE & FREQUENCY!

LCM-1950..........$79.95

- Large 1" 3-3/4 digit LCD
- Autoranging frequency to 4MHz
- Capacitance to 400µF
- Inductance to 40H
- Resistance to 4000MΩ
- Logic test
- Diode and transistor test
- Audible continuity test

SPECIFICATIONS

AC + DC Volts Accuracy	400mV, 4V, 40V, 400V, 1000V, 750VAC DC 1/2%, AC 1.5%	Resolution 100µV
AC + DC Current Accuracy	40mA, 400mA, 10A 1.5% DC 3% 20A, 2% AC 3.5% 10A	Resolution 10µA
Resistance Accuracy	400Ω, 4kΩ, 40kΩ, 400kΩ, 4000kΩ, 40MΩ, 4000MΩ 1% to 4000kΩ, 3% 40MΩ, 5% 4000MΩ	Resolution .1Ω
Capacitance Accuracy	4000pF, 40nF, 400nF, 4µF, 400µF 5%	Resolution 1pF
Inductance Accuracy	4mH, 40mH, 400mH, 4H, 40H 5%	Resolution 1µH
Frequency Accuracy	4kHz, 40kHz, 400kHz, 4000kHz 1/2%	Resolution 1Hz
Accessories	Test leads, Manual, 9V Battery included	
Size	3.5" W x 7.75" L x 1.5" D	



M-2612..........$39.95

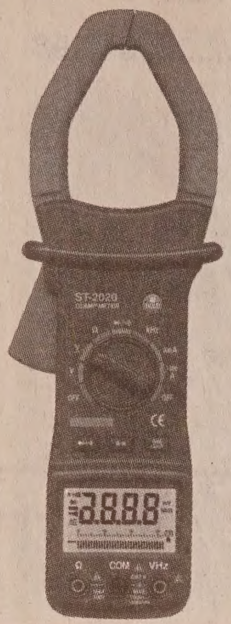
- Temperature to 1999°F.
- Large 3-1/2 Digit Display.
- 20µA Range on Current.
- Audible Continuity
- Temperature Probe Included.
- Ideal for HVAC

SPECIFICATIONS

AC + DC Volts Accuracy	200mV, 2V, 20V, 200V, 1000V, 750VAC 1/2% DC, .8% AC	Resolution .1mV
AC + DC Current Accuracy	200µA, 20mA, 200mA, 10A 1/2% DC, 1% AC	Resolution .1µA
Resistance Accuracy	200Ω, 2kΩ, 20kΩ, 200kΩ, 2MΩ, 20MΩ .8%	Resolution .1Ω
Temperature	0-1999OF	Probe Included
Accessories	Test leads, Manual, 9V Battery included	
Size	3.3" W x 7.3" L x 1.3" D	

ELENCO CLAMP ON & TEMPERATURE METERS ELENCO

Digital Clamp Meter
ST-2020....$57.88



Features

- Large Digital and Analog Display. 3,200 Count and 33 Segment Bar Graph.
- Auto/Manual Ranging Method.
- Backlighted Display.
- Audible Continuity.
- Diode Test.
- Available Continuity Test.
- Data Hold.
- Peak Hold.
- Deluxe Molded Carrying Case.

This meter has been designed according to IEC-1010-2-032 concerning safety requirement for hand-held current clamps for electrical measurement and test.

Specifications

AC Voltage	3/30/300V ±1.0%, 750V ±1.2%
DC Voltage	3/30/300V ±0.8%, 1,000V ±1.0%
AC Current	300A ±2.0%, 1,000A <600A ±2.0%, >600A ±3.0%
DC Current	300/600A ±3.0%
Resistance	300Ω/3kΩ/30kΩ/300kΩ/3MΩ ±1.5%, 30MW ±2.0%
Frequency	30kHz ±2.0%
Maximum Diameter for Conductor is 50mm.	
Dimensions	11" (H) x 4 7/64" (W) x 1 29/32" (D)
Weight	1 lb. 2 oz.

Digital Clamp Meter
ST-1010....$39.88

Features

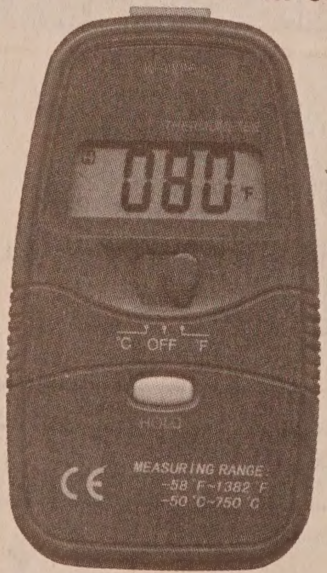
- 3 1/2 Digit, 2,000 Count LCD.
- Reads Up to 1,000A.
- Frequency.
- Data Hold.
- Peak Hold.
- Audible Continuity.
- Diode Test.
- Zippered Case Included.

This meter has been designed according to IEC-1010-2-032 concerning safety requirement for hand-held current clamps for electrical measurement and test.

Specifications

AC Voltage	200/600V ±1.0%
DC Voltage	2/20/200V ±0.5%, 1,000V ±0.8%
AC Current	200-600A ±2.0%, 600-1,000A ±3.0%
Resistance	200Ω/2kΩ/20kΩ/200kΩ/2MΩ ±1.0%
Frequency	2kHz ±1.5%
Diode Check	Check Forward or Reverse.
Continuity Check	Built-in Buzzer will Sound.
Data Hold	Provided
Insulation Test	20MΩ/2,000MΩ ±2% (requires 261 option)
Accessories	Test Leads, Manual, Case, 9V Battery Included.
Dimensions	9" (H) x 2 11/16" (W) x 1 1/2" (D)
Weight	11.5 oz.

Temperature Meter
M-602.....$29.95



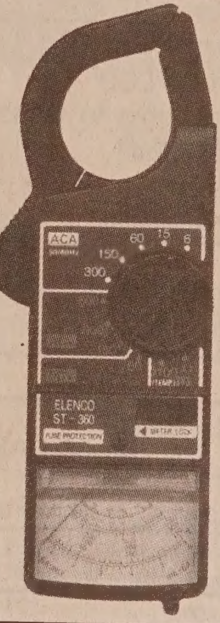
Features

- 3 1/2 Digit, 2,000 Count LCD Display.
- Temperature from –58°F to 1,382°F.
- K-type Thermocouple.
- C° or F° Readings.
- Data Hold.
- Low Battery Indicator

Specifications

Fahrenheit	–58°F to 1,382°F	Accuracy typ. ±0.75% +4°F
Celsius	–50°C to 750°C	Accuracy typ. ±0.75% +2°C
Resolution	1°C or 1°F	
Accessories	Carrying Case, K-type Probe, and Manual Included.	
Options	TP-02A Rod-type Probe (–50°F to 1,650°F).	
Dimensions	5" (H) x 2 3/4" (W) x 1" (D)	
Weight	5.1 oz.	

Analog Clamp Meter
ST-360....$47.88



Features

- Reads up to 300A.
- Meter Lock.
- Fuse Protected.
- Safety Test Leads.
- Compact Size.
- Case Included.
- Low Cost.

- TP-07 temp probe reads 60°F - 300°F (optional)

Specifications

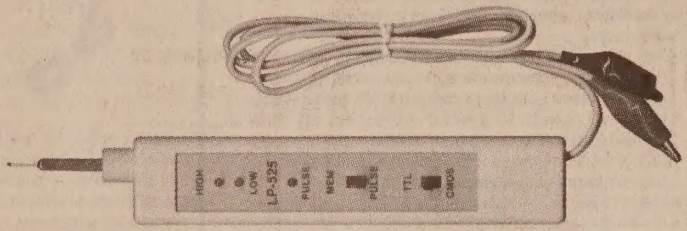
AC Voltage	150/300/600V	Accuracy ±3% Full Scale Reading (FSR)
AC Current	6/15/60/150/300A	Accuracy ±3% FSR
DC Voltage	60V	Accuracy ±3% FSR
Resistance	2kΩ, 200kΩ, (mid-scale 38kΩ, 3.8kΩ)	Accuracy ±3% FSR
Accessories	Test Leads, 1.5V "AA" Battery, and Manual Included.	
Dimensions	6 29/32" (H) x 3 5/16" (W) x 1 1/2" (D)	
Weight	9.9 oz.	

ELENCO DIGITAL LOGIC AND PULSER PROBES ELENCO

LP-525K LOGIC PROBE KIT

Hand held Digital Logic Probe provides convenient and precise use in the measurement of logic circuits. It displays logic levels (high or low), pulses and voltage transients down to 30 nanoseconds. High intensity LED readouts provide instant response to the logic state.

LP-525K $15.95

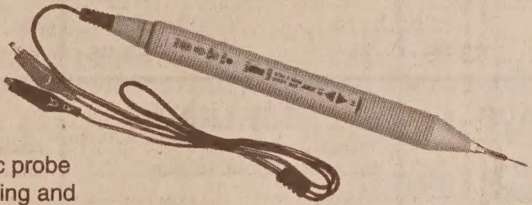


SPECIFICATIONS:

Input Impedance	100,000 ohms
Input overload protection	30V continuous
	120V 10 sec
Logic threshold	TTl Hi 2.3V Lo .8V
	Cmos Hi 70% Lo 30% of VCC
Response, better than	30 nsec
Pulse Detector	1.5 Mill sec pulse stretcher
Memory	Built-in reset

- Memory hold circuit
- Easy to use, hand held
- Reverse polarity protection
- Input impedance 1000,000 ohms
- No batteries or power supply required
- Discriminates between DTL-TTL/CMOS

MODEL LP-900 LOGIC PROBE & PULSER



A unique two in one logic probe & pulser for troubleshooting and analysing logic circuits – simultaneous tone output (high, low or both).

LP-900 .... $27.95

SPECIFICATIONS – LOGIC PULSER

Imput impedance	1 M ohm
Frequency response	Max 50MHz
Response Pulse width	10 nsec
Simultaneous tone output	high & low
Operating supply voltage	4VDC-18VDC

– LOGIC PROBE

Imput impedance	1 M ohm
Pulse rate	0.5/400 Hz
Pulse width	10μs
Power supply range	5-15VDC
Power supply protection	20VDC
External sync input	

LP-700 LOGIC PROBE

The L700 Logic Probe is a high speed digital trouble-shooting tool capable of capturing pulses as narrow as 20n sec. Four LED indicators determine the signal condition. Special memory circuits capture pulses fast oscilloscopes may miss.

- Select TTL-CMOS or Pulse - Pulse memory mode
- Captures any trasient pulse down to 20 nsec
- Discriminates between DTL-TTl or CMOS states

LP-700 .... $24.95

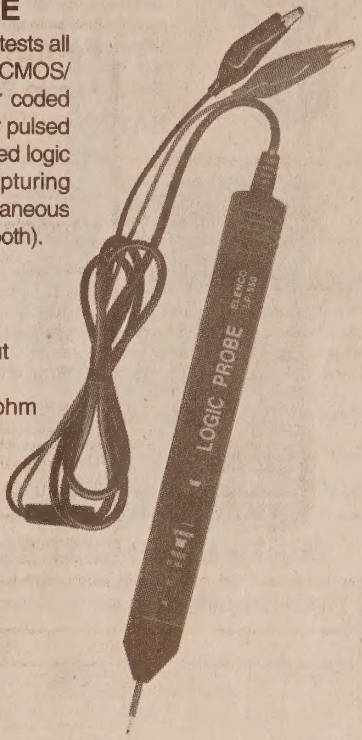
SPECIFICATIONS:

Imput impedance	1 M ohm
Response, better than	20nsec
Logic threshold	TTL Hi 2.3V Lo .8V
	CMOS Hi 70% VCC lo 30% VCC
Max Input Voltage	+50V
Max Supply Voltage	30V
Memory	latches on first transition

LP-550 .... $18.95
LOGIC PROBE

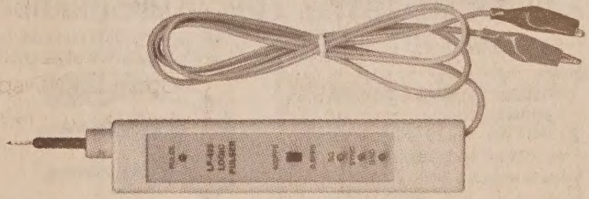
Audio and visual features, tests all logic families – TTL/LS and CMOS/MOS digital circuits. color coded LEDs indicate high, low or pulsed logic states. The high speed logic probe is capable of capturing pulses of 25nsec. Simultaneous tone output (high, low, or both).

- High speed – 25 nsec
- High & low tone output
- Color coded LEDs
- Input impedance 1M ohm



SPECIFICATIONS:

Working Voltage	DC4-16V
Current Consumption	Max. 32mA at 5V
Frequency Response	Max. 20MHz
Response Pulse Width	Longer than 25 nsec.
Imput Impedance	Min. 1MΩ
Input Overload Protection	± 250V DC/AC
Supply Voltage Protection	± 50V DC/AC



LP-425K LOGIC PULSER KIT

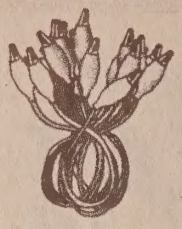
The Logic Pulser is a very effective tool for the inspection and repair of logic circuitry. It ca be used to directly inject a signal into a logic circuit without removing the IC or breaking the circuit. The LP-425K produces an output signal of up to 1 amp with a 2μ sec pulse width. It's a great help in isolating defective components.

LP-425K $15.95

SPECIFICATIONS:

a. Sync imput impedance	1M ohms
b. pulse repetion rate	0.5 pps/500pps
c. pulse width in pulser output at 1000mA load	2us
d. output current (1) pulser mode	100mA sink/source
(2) 90% pulse mode	20mA sink/source
e.Power supply protection	± 25V/10 sec
f. Output protection	± 50V/1min

TEST LEADS & ALLIGATOR CLIPS



JUMPER TEST CORDS

5 pairs of jumper cords consisting of 10 leads, 14" long. Every lead has a miniature insulated alligator clip at each end, making 20 clips in all. Colors of cords are: Red, Green, Black, Yellow and White. Ideal for servicemen and amateurs for testing purposes, repairs, experimenting, etc.
Each cord contains 3 strands of .18mm wire.

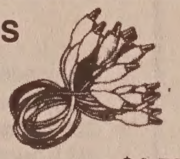
SA10 .... $6.50

Same as above except heavier gauge cords; each cord including alligator clips is 22" long. 12-stranded .18mm wire.

SA22 .... $6.95

HEAVY DUTY JUMPER TEST CORDS

Five 22" individual jumper cords with flexible plastic insulation. Each heavy duty cord terminates into a strong spring-insulated alligator clip. The colors for each cord kit are: White, Green, Black, Yellow and Red. 20-Stranded .18mm wire.

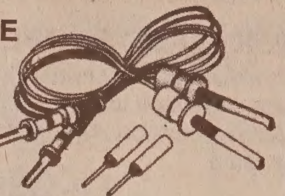


SA44 .... $4.50

Same as SA44 except cords are 36" long.

SA45 .... $5.80

ALL-PURPOSE TEST LEAD SET

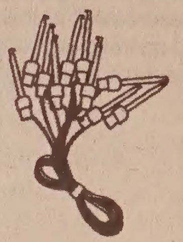


The most useful test leads yet devised. Use them in the conventional manner or adapt them to individual requirements.

- Tiny, sturdy, push-to-clip prods can be firmly attached to hard-to-reach components in chassis–whether large or small terminals. Clip-onto-component feature enables you to test parts for long periods without actually handing the test leads. Hands are free for other work.
- Each prod is connected with solderless, kinkless wire terminating in an insulated banana plug.
- A removable, nickel-plated phone tip (supplied) fits over the banana plug allowing the individual the option of using meters with either banana or phone tip jacks.
- Overall lead length is 36 inches.
- Two unbreakable high dielectic strength prods, black and red.

TLS470 .... $6.95

IC TEST LEAD SET

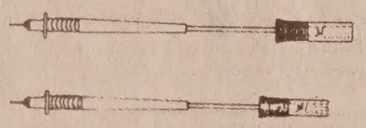


5 color-coded 16" test leads with miniature hook-on prods at both ends. A must for technicians and experimentors who want temporary interconnects without danger of shorting.
Colors: Red, black, yellow, green, white

500 .... $9.75

MULTI-METER TEST PROD

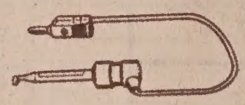
Shrouded safety banana jack designed to fit most multimeters that have shrouded safety plug imputs. Packaged 1-red, i-black.



9321 ... MOST MULTIMETERS ... $9.95
9829 ... SIMPSON 260 SERIES 7 ... $10.95

TEST LEADS

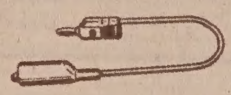
Banana to minigrabbers. Set of black & red 36" long.



TL12 .... $3.95

TEST LEADS

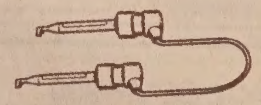
Stackable banana to alligator 36" long.



TL5 .... $3.95

IC CLIP TEST LEAD SET

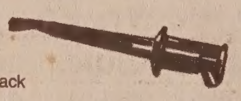
36" long red and black test leads with IC clip (minigrabber) on each end. 220 gauge wire.



TL9 .... $3.95

IC TEST CLIPS

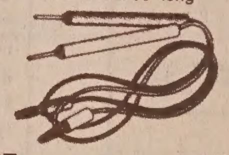
Firmly clips onto larger or small wires or terminals.
2 per. package — 1-red, 1-black



65-303 .... $1.90

TEST LEADS

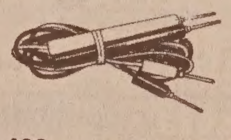
Banana to test prod.
Set of black and red. 36" long



467 .... $3.75

TEST LEADS

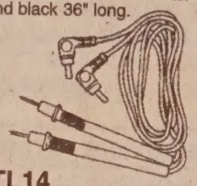
Phone tip to test prod.
Set of black and red. 36" long



466 .... $3.75

TEST LEADS

Insulated banana to test probe. Red and black 36" long.



TL14 .... $3.95

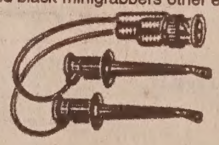
UNIVERSAL TEST LEAD KIT

Contains:
- 2 black and red leads 36" long w/ screw on bases.
- 2 each black and red alligator clips.
- 1 each black and red probes.
- 4 banana plugs, 2 pin plugs, 2 lugs.

TL10 .... $4.95

BNC to MINI GRABBERS

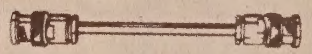
Shielded 42" long BNC one end, red and black minigrabbers other end.



TL3 .... $4.95

BNC to BNC

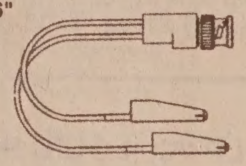
BNC to BNC connectors nickel plated black cable, 3 ft. long.



TL7 .... $3.95

BNC to ALLIGATOR CLIPS

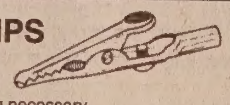
Length 36"



TL-17 .... $3.95

ALLIGATOR CLIPS & TEST LEAD WIRE

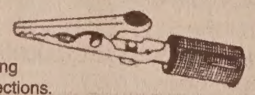
ALLIGATOR CLIPS



Nickel-plated with screw connection. Strong spring with hard bite. 2" long. No soldering necessary.

10120 .... $.24

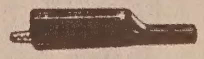
INSULATED



Equipped with screw, making it ideal for solderless connections.
Overall length 2" plastic insulating sleeve 5/8".

10120B-BLACK .... $.26
10120R–RED .... $.26

WITH PLASTIC BOOTS



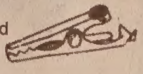
Strong spring sure-grip nickel-plated alligator clips, with snug-fitting insulating plastic boots.

NO.	TYPE	CLIP LENGTH	BOOT LENGTH	PRICE
268*	Miniature	7/8"	1"	.19
269*	Medium	1 1/4"	1 5/8"	.23
270*	Large	1 1/2"	2 1/8"	.29

* Add "B" for black - "R" for red

SUBMINIATURE N.P.

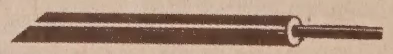
Exceptionally small clip ideal for printed circuit and minature teating. Strong spring for sure grip. Only 7/8" long.



267 .... $.15

RUBBER KINKLESS TEST LEAD WIRE

Suitable as Test Lead Wire in analyzers, instruments, oscillators, meters, etc. Wherever extra flexibility and limpness is necessary. Single conductor, extra flexible stranded soft tinned copper, wall color coded rubber.
Rated 5000V. COLORS: Red, Black
OPERATING TEMPERATURE: -20°C to +60°C



Minimum 5' purchase required

PART NO.	COLOR	PRICE PER FOOT
TL18BK	BLACK	.30
TL18RD	RED	.30

ELENCO

FREQUENCY COUNTERS

ELENCO

Hand-Held 2.8GHz Universal Counter

Model F-2800

A compact, pocket-size test instrument, designed for ease of use and dependable performance. Advanced features such as Field Strength Measurement are incorporated in the F-2800.

ELENCO F-2800
Frequency Period PRESCALE HOLD
8.8.8.8.8.8.8.8.8.8
1MHz-3GHz/50Ω FREQUENCY COUNTER
CAL
POWER ON
RANGE 3GHz
HOLD
GATE
OFF
300MHz

Features

- 50Ω input for full range 1MHz to 2.8GHz coverage.
- High speed 250MHz direct count with 1Hz per second resolution.
- 10 digit LCD display.
- Ultra-sensitive synchronous detector bargraph with 16 segment display of RF signal strength.
- Low power consumption 6 hour NiCd battery operation.
- Low battery indicator.
- Hold switch locks display.
- Supplied with telescoping whip antenna and AC wall adapter.

Specifications

INPUT SENSITIVITY (Typical)

Amplifier	50Ω
Impedance	50Ω , VSWR<2:1
Range	1MHz - 2.8GHz
Sensitivity	<0.8mV @ 100MHz <6mV @ 250MHz <7mV @ 1GHz <100mV @ 2.4GHz
Maximum Input	15dBm

FREQUENCY DISPLAY RESOLUTION

Range	Gate Time	LSD
250MHz	0.0625 sec.	10Hz
	0.25 sec.	1Hz
	1 sec.	0.1Hz
	4 sec.	0.1Hz
2.8GHz	0.0625 sec.	1000Hz
	0.25 sec.	100Hz
	1 sec.	10Hz
	4 sec.	10Hz

RF Signal Strength Bargraph

Frequency	1st Segment	Full Scale
27MHz	7mV	100mV
150MHz	5mV	90mV
800MHz	10mV	200mV

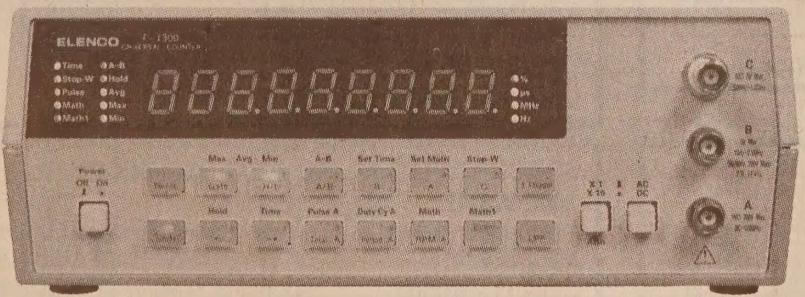
Cabinet: Extruded aluminum, black paint finish.
Display: 10 Digit Liquid Crystal Display.
Size: 6 1/8" (H) x 2 5/8" (W) x 1 1/4" (D)
Weight: 0.5lb.
Battery: Internal 4 "AA" 600mAH NiCd battery pack
Power: 9VDC, 500mA wall plug adapter.
Time Base: <1ppm typ. at room temperature.

Optional Accessory: C-2800 Case with Belt Clip

F-2800............FREQUENCY COUNTER............$119.95
C-2800.............CASE WITH BELT CLIP...............$14.95

10 Function 1.3GHz Universal Bench Counter

Model F-1300



The **F-1300** is a modern microcontrolled counter designed for a wide range of service and laboratory applications. The unit features 10 main functions: Frequency, Period, Totalize, RPM, Time (max, min, avg), Math and Pulse Width. All functions are displayed on large green LED digits. It is housed in a rugged lightweight case. This counter features a low pass filter which enables the limitation of high frequency noises from low-frequency measurements.

Features:

- Frequency - .05Hz to 1.3GHz 3 Ranges
- Period - Can read 60Hz to 60.000000 F= 1/T
- Totalize - Counts to 199,999,999
- RPM - 3 to 2099994 RPM
- Duty Cycle
- Max/Min/Avg with Time
- Stop-watch set .2 sec to 100 hrs.
- Math functions
- Timer - 2 sec to 99 days
- Pulse Width - .1ms to 66666.6ms

SPECIFICATIONS

CH-A	
Frequency	0.05Hz to 120MHz
Impedance	1MΩ shunted by less than 40pF
Sensitivity	20mV RMS
Filter	Low pass, -3dB point of 100kHz
Period	19999999.9μ s to 0.0083μ s
Totalize	0 - 200MHz
Ratio	CH-A (frequency) / CH-B (frequency)
A-B	CH-A (frequency) - CH-B (frequency)
R.P.M.	3 to 20999994 RPM
Duty	0.01% to 99.99%
Pulse	0.1μ s to 66666.6μs
CH-B	
Frequency	10Hz to 2.5MHz
Sensitivity	TTL level
Impedance	<100kΩ shunted by <100pF
CH-C	
Frequency	50MHz to 1.3GHz prescaled by 64
Impedance	50Ω
Sensitivity	15mV (-17.4 dbm)
General	
Time base crystal control 10MHz	
Aging rate < .8PPM/M	
Display: 9 digit 0.56" seven-segment digits	
Power Requirement: 115V, 230V (±15%)	
Dimensions: 3.8" H x 10.8" W x 11.1" D	
Weight: 5lbs.	

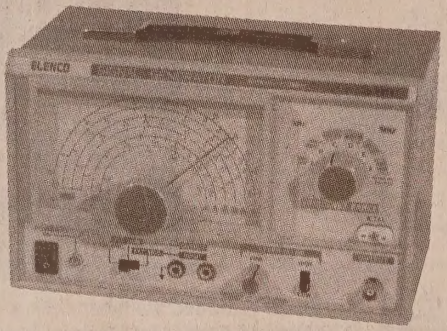
F-1300.................................FREQUENCY COUNTER.................................$229.95

ELENCO RF & AUDIO GENERATORS ELENCO

Models SG-9500 and SG-9000 are stable high frequency generators capable of AM modulation. They are primarily designed for work on AM and FM radio receivers, but can be used in any project requiring a modulated RF signal.

Models SG-9200 and SG-9300 are low cost audio generators featuring very low distortion sine wave and a rapid-rise square wave. All models have vernier frequency control for easy tuning and switchable high-low output levels.

Wide Band RF Signal Generators



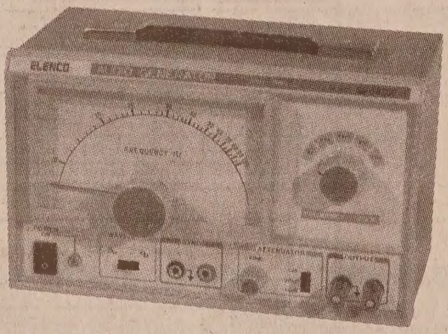
$149.95

Model SG-9000 RF Generator

$279.95

Model SG-9500 RF Generator w/ Counter

Audio Generators



$149.95

Model SG-9200 Audio Generator

$295.95

Model SG-9300 Audio Generator w/ Counter

Models SG-9300 and SG-9500 have built-in frequency counters which is switchable to measure external frequencies up to 150MHz.

SPECIFICATIONS: SG-9000 & SG-9500

Frequency on 6 ranges
100kHz to 150MHz (450MHz on harmonics)

Band A	100kHz - 300kHz
Band B	300kHz - 1000kHz
Band C	1MHz - 3.2MHz
Band D	3MHz - 10MHz
Band E	10MHz - 35MHz
Band F	32MHz - 150MHz
Harmonics	96MHz - 450MHz

FEATURES SG-9000 / 9500

- RF frequencies continuously variable 100kHz to 450MHz in six ranges.
- Output RF voltage variable and has 20dB attenuator switch.
- Internal AM modulation of 1kHz.
- Audio 1kHz signal available at output.
- External crystal locks oscillator to your frequency between 1-15MHz.
- 455kHz, 4.5MHz and 10.7MHz specially noted for easy setting.

Frequency Accuracy:
SG-9000 ± 3%
SG-9500 1PPM ±1 count

RF Output Approx.	100mV to 35MHz
Crystal Output	1-15MHz uses HC 6/U holder
Output Attenuator	Hi-Lo Sw with fine adjuster
Modulation Internal	1kHz
External	50Hz to 20kHz
Audio Output	1kHz at 1V RMS
Power	120V or 220V 50 or 60Hz
Size	6" H x 10" W x 5 1/4" D
Weight	5.5 lbs.

Accessories: Detachable line cord, RF cable, Instruction manual.

SPECIFICATIONS: SG-9200 / SG-9300

SINE WAVE	
Frequency Range	10Hz - 1MHz (5 decade bands)
Accuracy	3% +2Hz
Output Distortion	500Hz to 50Hz less than 0.05% 50Hz to 500kHz less than .5%
Output Voltage	8V RMS 600 ohm impedance
Output Flatness	± 1dB attenuator plus fine adjust
SQUARE WAVE	
Frequency Range	10Hz to 100kHz (SG-9200) 20Hz to 20kHz (SG-9300)
Rise Time	.5 µsec.
Output Voltage	15Vpp

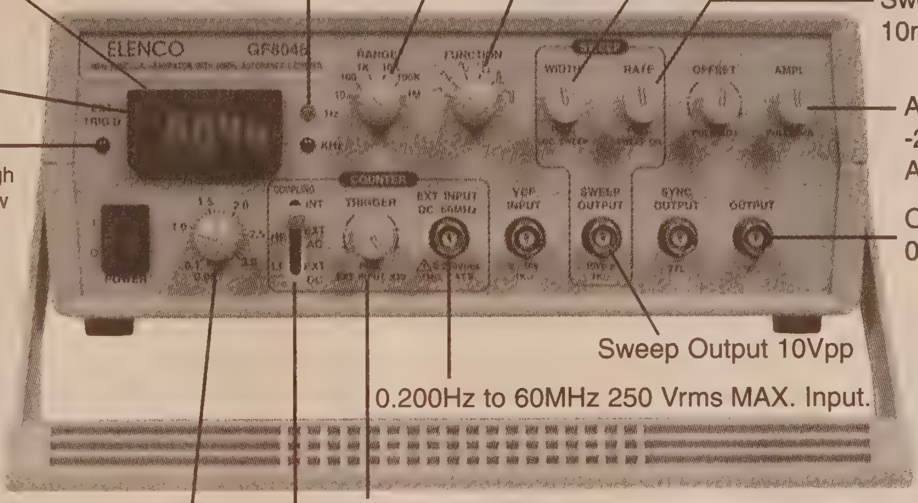
POWER 120 or 220VAC 50 or 60Hz
DIMENSION AND WEIGHT 6"H x 10"W x 5 1/4"D 5.5lb.

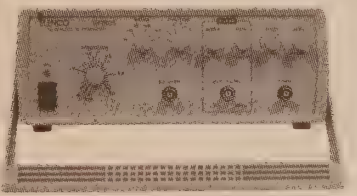
SPECS: SG-9300 / SG-9500 FREQ COUNTER

Range	1Hz - 150MHz in 2 ranges
Resolution	1Hz or 10Hz
Gate Time	.1 sec, 1 sec
Input Sensitivity	Less than 50mV RMS
Input Impedance	1MΩ
Accuracy	10PPM ± 1 count
Operation Temp	0-40°C
Digital Display	5 Digit .56" LED

ELENCO SWEEP FUNCTION GENERATOR ELENCO

Model GF-8046............$229.95
with Built-in Frequency Counter


Decimal Point
Hz/kHz LED Auto Select
Rotary Switch 6 Range
6 Function Waveform
Linear/Log Sweep
5 Digit Red LED Autorange Counter (GF-8046 only)
Sweep Rate from 10mS to 5S
Auto Gatetime
Amplitude with -20dB Attenuator
EXT TRIG'D LED
Light - Trig Level Too High
Dark - Trig Level Too Low
Flashing - Triggering
Output Lever from 0.1Vpp to 20Vpp
Sweep Output 10Vpp
0.200Hz to 60MHz 250 Vrms MAX. Input.
EXT Counter Trigger Level Control and Input Attenuator -26dB
Frequency: X0.05 ~ X3.0
AC/DC, HF/LF, 100kHz Filter Switch

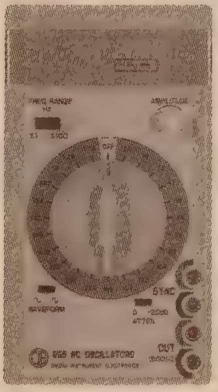


Model GF-8025
without Frequency Counter

MAIN OUTPUT	
Frequency Range	0.5Hz to 3MHz in 6 Ranges
Waveforms	6 Waveforms (Sine, Square, Triangle, Ramp, +Pulse, -Pulse
Amplitude	20Vpp / Open, 10Vpp / 50Ω Load
Attenuator	0dB, -20dB (±2%)
Output Impedance	50Ω (±2%)
DC Offset	±10V with Pull ADJ Switch
Freq. Accuracy	Counter Accuracy (GF-8046) Sine wave on full scale <3% (GF-8025)
Distortion	<1%, 1Hz to 100kHz
Rise / Fall Time	<60ns
V.C.F. Input	0 to +10V Control Frequency to 1000:1
SYNC OUTPUT	
Rise Time	<40ns
Level	<3Vpp (open)
Waveform	Square, Pulse
SWEEP	
Mode	Linear / Log Sweep
Width	>100:1 Continuously Variable
Sweep Output	10Vpp (open)
Output Impedance	1kΩ + 2%

COUNTER (GF-8046 only)	
Display	5 Digit 0.36 Red LED Display with Autorange
Gate Time	Auto Select (0.25S ~ 10S)
Resolution	0.001Hz
MODE	INT Function Generator / EXT Counter
Attenuator	0dB, -26dB (20)
Accuracy	± Time Base Accuracy ± 1 Count
Time Base	20MHz ± 10ppm (23 ± 5°C)
Frequency Range	0.2Hz ~ 60MHz
Sensitivity	25m Vrms at 1MHz
Max. Input	250 Vrms
Input Impedance	1MΩ ± 2%
Power Source	AC 115V / 230V ±10%, 50/60Hz, 25W
Dimensions	10.8" (W) x 3.5" (H) x 11.8" (D)
Weight	5.5lbs. (GF-8046), 4.8lbs. (GF-8025)
Safety Approvals	UL, CUL, GS, TUV, CE, IEC1010, EN61010

Model GF-800



20Hz - 150kHz LOW DISTORTION Sine/Square Wave Audio Generator

- Sine and square wave generator
- 20Hz to 150kHz in 46 steps
- Low distortion R-C oscillator
- Variable output control
- Low battery indicator
- Compact portable, light weight

SPECIFICATIONS

Frequency Range: x1 range 20Hz to 1.5kHz (23 steps), x100 range 2kHz to 150kHz (23 steps)
Accuracy: 20Hz through 100kHz (±3% or less), 120kHz and 150kHz (±5% or less)
Output Control: 0dB/-20dB attenuator switch and variable amplitude control
Output Impedance: approximately 600Ω
SINEWAVE CHARACTERISTICS
Output Voltage: ≥1.2V rms at max. setting (no load)
Output Flatness: (short term) 20Hz to 150kHz +0.5dB (reference frequency 1kHz)
Distortion: 200Hz - 15kHz <0.05% 15kHz-150kHz <0.3%
SQUARE WAVE CHARACTERISTICS
Output Voltage: ≥5V p-p at maximum setting
Rise & Fall Time: Less than 0.5μ s
Sag: Less than 5% at 20Hz (DC coupled)
Over Shoot: <2% from maximum output, to 50mV p-p
Duty Ratio: 50% ±5%
SYNCHRONIZATION CHARACTERISTICS
Output Voltage: ≥1.2 rms (no load)
Output Impedance: 1kΩ ±5%
Other specifications same as sinewave characteristics

GF-800 ....$59.95

1MHz Function Generator

SPECIFICATIONS

OUTPUT:
Waveforms: Sine, Square, Triangle
Frequency: 1Hz - 1MHz
Impedance: 600Ω ±10%
Amplitude: Sine/Triangle 0-3V at 12V DC input
Squarewave .5-12V (no load)
Frequency Variable Range: 100:1 or more
Frequency Multiplier: x1, x10, x100

SINE WAVE
Distortion: Less than 1%
Flatness: ±0.5 dB 1Hz-100kHz
Temperature Stability: ±20ppm/°C Typical

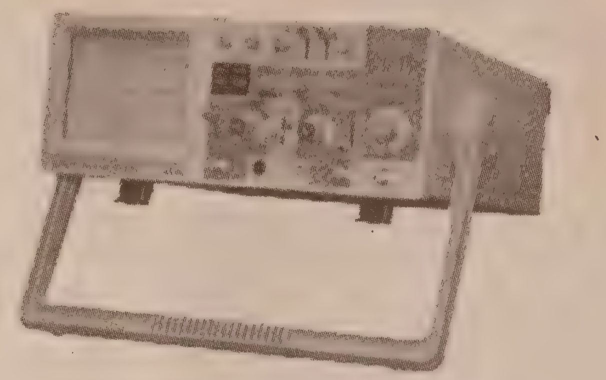
SQUARE WAVE
Symmetry: Less than 5% (at 1kHz)
Rise & fall time: Less than 300ns (at 1kHz)

TRIANGLE WAVE
Linearity: Less than 1% (up to 100kHz)
Power Requirements: 9 to 18V DC at input

ELENCO ELECTRONICS
FUNCTION GENERATOR
FREQUENCY
COARSE
AMPLITUDE
TRIANGLE

FG-500 (ASSEMBLED & TESTED)...................................$42.95
FG-500K (KIT FORM)...$31.95

ELENCO OSCILLOSCOPES ELENCO



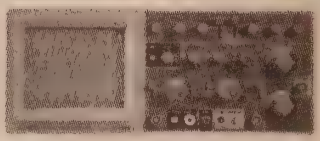
MODEL S-1325 25MHz

FEATURES

- 2 Channel
- DC:DC to 25MHz (within -3dB)
- Weight 16.7 lbs.

S-1325 .... $349.95

MODEL S-1340 40MHz



FEATURES

- 2 Channel
- DC:DC to 40MHz (within - 3dB)
- Acceleration Potential: Approx. 10KV
- Weight 17.2 lbs.

S-1340 .... $449.95

MODEL S-1360 60MHz

FEATURES

- 2 Channel
- DC:DC to 60MHz (within -3dB)
- Delay Sweep (.1µs to .25/div)
- Beam Find
- Component Tester
- Z-Modulation - Y (CHB) Output
- Acceleration Potential: Approx. 12KV
- Weight 17.2 lbs.

S-1360 .... $699.95

MODEL S-1345 40MHz

FEATURES

- 2 Channel
- DC:DC to 40MHz (within -3dB)
- Delay Sweep (.1µs to .25/div)
- Beam Find
- Component Tester
- Z-Modulation - Y (CHB) Output
- Acceleration Potential: Approx. 10KV
- Weight 17.2 lbs.

S-1345 .... $545.95

MODEL S-1330 25MHz

FEATURES

- 2 Channel
- DC:DC to 25MHz (within -3dB)
- Delay Sweep (.1µs to .25/div)
- Beam Find
- Component Tester
- Z-Modulation - Y (CHB) Output
- Acceleration Potential: Approx. 2KV
- Weight 16.7 lbs.

S-1330 .... $449.95

SPECIFICATIONS COMMON TO ALL

VERTICAL AXIS

Sensitivity	5mV — 5 V/div ± 3% 10 steps selectable in 1-2-5 sequence with variable ctl
Magnification	5 times 1 mV/div — (at x5 MAG)
Bandwidth	AC: 10 MHz — 40 MHz (within -3 dB)
Rise time	9 ns or less (18ns – S1330, S1325)
Overshoot	5% or less
Input impedance	1 M Ω shunted by 25 pF ± 10 pF
Maximum input voltage	400 (DC + AC peak)
Operation mode	CH1, CH2, DUAL (ALT or CHOP) and ADD
Chop Frequency	Approx. 500 kHx
Polarity selection	Possible only in CH2

HORIZONTAL AXIS

Sweep time (nominal)	0.1 µs — 0.2 s/div ± 3% 20 steps selectable in 1-2-5 sequence
Sweep Time (delay)	0.1 µs to .25/div 20 steps selectable in 1-2-5 sequence
Magnification	x10 to 10ns/div
Linearity	3% or less
Accuracy	±3%
Hold off time	Variable up to 5 times

TRIGGER

Trigger signal source	CH1, CH2), ALT, LINE, EXT
Trigger sensitivity auto	100Hz-60MHz≥ 1.5V div (INT)≥ .1V p-p (EXT)
(norm)	DC-60Hz-1KHz: .5 div (INT); ≥ .1V p-p (EXT)
(TV-V)	20Hz-1KHz: .5 div (int); ≥ .05V p-p (EXT)
(TV-H)	1KHz-100KHz: .5 div (int); ≥ .05V p-p (EXT)
Coupling	Auto, Norm, TV-V, TV-H

X-Y OPERATION

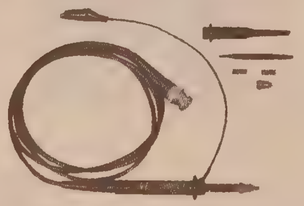
Sensitivity	X-axis: Same as CH2, Y-axis: Same as CH1
X-axis bandwidth	DC to 2 MHz (at -3 dB)
Phase Shift	Less than 3"at DC to approx 100KHz

GENERAL

Calibration Signal	2 Vp-p ± 3%; 1KHz Square wave
CRT	6 inch screen with lighted internal graticule P31 phosphor; 8x10 divisions
Power Requirements	90-137VAC or 198-264VAC 50/60Hz, 40W consumption
Dimensions	12.8"W x 5.2"H x 15.6"D
Standard accessories	Operation manual, powercord, spare fuse 2 switchable 1x, 10x probes

OSCILLOSCOPE PROBES

O-SCOPE PROBES



65MHz SCOPE PROBE

Built in 3 position switch: X1, Ref, X10.
10 Meg ohms input impedance.
Fits all scopes with BNC connector.

OP-1 .... $19.95

100MHz SCOPE PROBE

Built in 3 position switch: X1, Ref, X10.
Complete with 5 accessories.
10 Meg ohms input impedance.
Fits all scopes with BNC connector.

OP-2 .... $24.95

REGULATED POWER SUPPLIES — 13.8 VDC OUTPUT

3 AMP CONSTANT 13.8VDC

- Perfect for Home, Shop and Hobbyist
- Input: 115V AC, 60Hz, 50 Watts
- Output: 13.8V DC
- 3 AMP Constant/4 AMP Surge
- Powers Cell Phones, 12 V DC CB Radios, Scanners, etc.
- Screw Terminal Connectors
- Electronic Overload Protection w/Auto Reset
- Short Circuit Protection
- Fuse Protected
- Heavy Duty Cabinet & Heatsink with Anti-Skid Rubber Feet
- 7 1/8D x 3W x 4 7/8"H

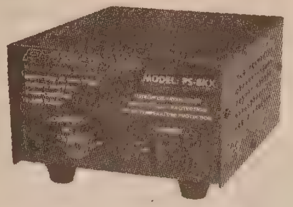
PS-3 .... $21.95

5 AMP CONSTANT 13.8VDC

- Perfect for Home, Shop and Hobbyist
- Input: 115V AC, 60Hz, 70 Watts
- Output: 13.8V DC
- 5 AMP Constant/7AMP Surge
- Powers Cell Phones, 12 V DC CB Radios, Scanners, etc.
- Screw Terminal Connectors
- Electronic Overload Protection w/Auto Reset
- Short Circuit & Thermal Protection
- Fuse Protected
- Heavy Duty Cabinet & Heatsink with Anti-Skid Rubber Feet
- 7 1/8D x 3W x 4 7/8"H

PS-5 .... $29.95

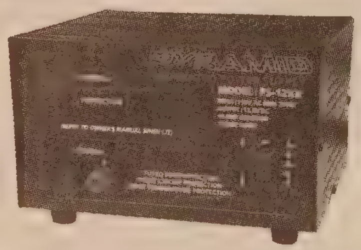
6 AMP CONSTANT 13.8VDC



- Perfect for Home, Shop and Hobbyist
- Input: 115V AC, 60Hz, 100 Watts
- Output: 13.8V DC
- 6 AMP Constant/8 AMP Surge
- Powers Cell Phones, 12 V DC CB Radios, Scanners, etc.
- Screw Terminal Connectors
- Electronic Overload Protection w/Auto Reset
- Short Circuit & Thermal Protection
- Fuse Protected
- Heavy Duty Cabinet & Heatsink with Anti-Skid Rubber Feet
- 7 1/8D x 3W x 4 7/8"H

PS-6 .... $32.95

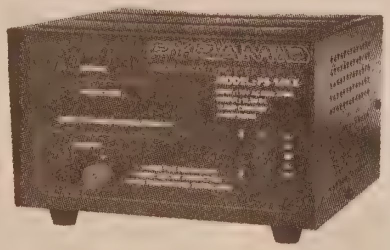
10 AMP CONSTANT 13.8VDC



- Perfect for Home, Shop and Hobbyist
- Input: 115V AC, 60Hz, 250 Watts
- Output: 13.8V DC
- 10 AMP Constant/12 AMP Surge
- Powers Cellular Phones, 12 V DC CB Radios, Scanners, HAM Radios, Autosound Systems, etc.
- Screw Terminal Connectors
- Electronic Overload Protection w/Auto Reset
- Short Circuit & Thermal Protection
- Fuse Protected
- LED Condition Indicators
- Heavy Duty Cabinet & Heatsink with Anti-Skid Rubber Feet
- 7 1/2"D x 4 1/2"W x 7 1/4"H

PS-10 .... $49.95

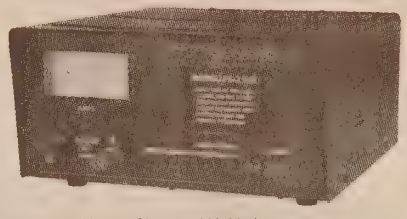
12 AMP CONSTANT 13.8VDC



- Perfect for Home, Shop and Hobbyist
- Input: 115V AC, 60Hz, 270 Watts
- Output: 13.8V DC
- 12 AMP Constant/14 AMP Surge
- Powers Cellular Phones, 12 V DC CB Radios, Scanners, HAM Radios, Autosound Systems, etc.
- Screw Terminal Connectors
- Electronic Overload Protection w/Auto Reset
- Short Circuit & Thermal Protection
- Fuse Protected
- LED Condition Indicators
- Heavy Duty Cabinet & Heatsink with Anti-Skid Rubber Feet
- 7 1/2"D x 4 1/2"W x 7 1/4"H

PS-12 .... $59.95

18 AMP CONSTANT 13.8VDC



- Perfect for Home, Shop and Hobbyist
- Input: 115V AC, 60Hz, 450 Watts
- Output: 13.8V DC
- 18 AMP Constant/20 AMP Surge
- Powers Cellular Phones, 12 V DC CB Radios, Scanners, HAM Radios, Autosound Systems, etc.
- Screw Terminal Connectors
- Crowbar Over Voltage Protection
- Electronic Overload Protection w/Auto Reset
- Short Circuit & Thermal Protection
- Fuse Protected
- LED Condition Indicators
- Built-in Cooling Fan
- Heavy Duty Cabinet & Heatsink with Anti-Skid Rubber Feet
- 11 5/8"D x 9 1/8"W x 4 1/2"H

PS-18 .... $79.95

CURRENT/VOLTAGE METERS & COOLING FAN

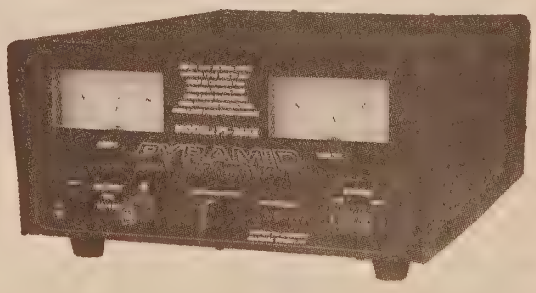
22 AMP

- Perfect for Home, Shop and Hobbyist
- Built in Cooling Fan
- Input: 115V AC, 60Hz, 500 Watts
- Output: 6~15V DC(Adjustable)
- 22 AMP Constant/25 AMP Surge
- Powers 6~15V DC Devices such as Cellular Phones, CB Radios, Scanners, HAM Radios, Autosound Systems, etc.
- Screw Terminal Connectors
- Crowbar Over Voltage Protection
- Electronic Overload Protection w/Auto Reset
- Short Circuit & Thermal Protection
- Fuse Protected
- LED Condition Indicators
- 3 Prong Grounded AC Plug
- Heavy Duty Cabinet & Heatsink with Anti-Skid Rubber Feet
- 11 5/8"D x 9 1/8"W x 4 1/8"H

PS-22...$109.95

CURRENT/VOLTAGE METERS & COOLING FAN

32 AMP

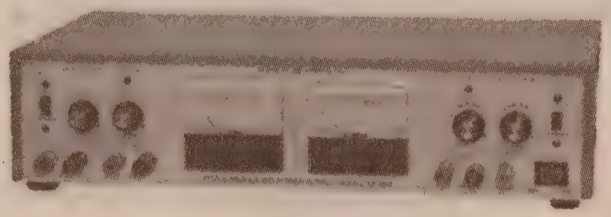


- Perfect for Home, Shop and Hobbyist
- Built in Cooling Fan
- Input: 115V AC, 60Hz, 700 Watts
- Output: 12~15V DC(Adjustable)
- 32 AMP Constant/35 AMP Surge
- Powers 12V DC Devices such as Cellular Phones, CB Radios, Scanners, HAM Radios, Autosound Systems, etc.
- Screw Terminal Connectors
- Crowbar Over Voltage Protection
- Electronic Overload Protection w/Auto Reset
- Short Circuit & Thermal Protection
- Fuse Protected
- LED Condition Indicators
- 3 Prong Grounded AC Plug
- Heavy Duty Cabinet & Heatsink with Anti-Skid Rubber Feet
- 11 5/8"D x 9 1/8"W x 4 1/8"H

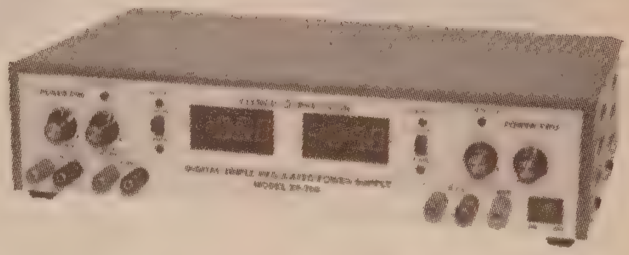
PS-32...$149.95

ELENCO VARIABLE VOLTAGE POWER SUPPLIES ELENCO

The Elenco variable voltage supplies all feature fail-safe automatic overload protection. Maximum output current is externally adjustable. Special circuits protects equipment, user and itself. Current limiting adjustment is easy, simply short output and adjust limit control to read desired maximum current. The output voltage is continuously variable and precisely held to your setting. Ideal for use in labs, service shops, schools, home and industry.



Dual
0-20V at 1A
5V at 5A



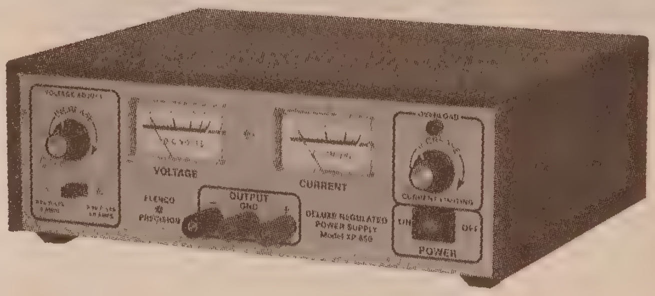
MODEL XP-660 . . . $179.95

MODEL XP-760 . . . $229.95

The XP-660 and XP-760 contain three fully regulated power supplies. Two are 0-20V at 1 amp and a fixed 5V at 5A. All three are isoloted from each other so that they can be stacked to produce up to 45V at 1 amp. All supplies are protected against short circuit. The 0-20V supply incorporates externally controlled current cutoff circuits with a LED indicating current overload. Model XP-660 has two meters which can read voltage or current. Model XP-760 has two 3 digit Volt/Current meters.

Model XP-650.........$124.95

0-40V @ 1 1/2A or 0-20V @ 3A

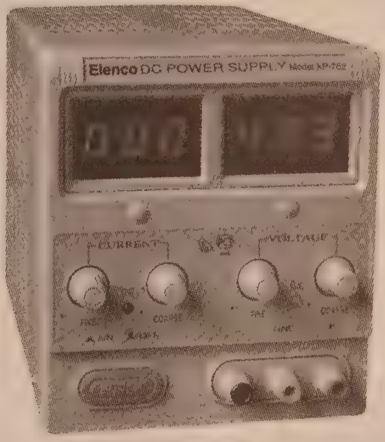


Made in U.S.A.

The **XP-650** is a continuously variable regulated power supply which delivers 0-20V @ 3A or 0-40V @ 1.5A. It is protected against short circuits and has an externally controlled current cutoff. The Model **XP-650** has two analog meters which read voltage and current.

Model XP-752.............$129.95

0-50V @ 3A



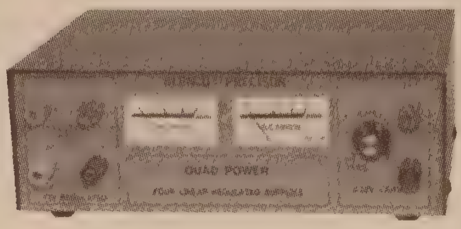
The **XP-752** has an output of 50VDC @ 3A. Its features include fine and coarse controls for voltage and current, and contains two 3 digit LED Volt / Current meters.

The supply incorporates an externally controlled current cutoff circuit with an LED indicating current overload. Protected against short circuits and overloads.

SPECIFICATIONS	XP-650	XP-752	XP-660	XP-760	XP-603	XP-720	XP-620	XP-605
INPUT VOLTAGE	120V/240VAC	120/240VAC	120VAC	120VAC	120VAC	120VAC	120VAC	120/240VAC
OUTPUT VOLTAGE	0-40VDC	0-50VDC	0-20,0-20,5	0-20,0-20, 5	0-30VDC	SEE PAGE 15	1.5-15,–1.5-15,5V	0-30VDC
OUTPUT CURRENT	1.5/3A	3A	1A,1A,5A	1A,1A,5A	3A		1A,1A,3A	5 A
LOAD REGULATION	.1volts	<1%	.1volts	.1volts	<1%	.1volts	.1volts	<1%
LINE REGULATION	.1volts	<1%	.1volts	.1volts	.1volts	.1volts	.1volts	<1%
RIPPLE MAX. RMS	.005V	.001V	.005V	.005V	.30MV	.005V	.005V	.001V
CURRENT PROTECTION	.05-3A lim	.05-3A lim	.05-1A lim	.05-1A lim	3A Fuse	1A,3A lim	1A,3A lim	.05-5A lim
SHORT PROTECTION	.05-3A lim	.05-3A lim	.05-1A lim	.05-1A lim	CURRENT LIMITING	1A,3A lim	1A,3A lim	.05-5A lim
OUTPUT IMPEDANCE	.025 ohms	———	.025 ohms	.025 ohms	.025 ohms	.025 ohms	.025 ohms	———
METER	40V,3A 5%	DUAL 3 DIGIT LED	20V, 1A	Dig. 1/2%	ANALOG 30V, 3A	NONE	NONE	ANALOG 30V, 3A
DIMENSIONS (W"XD"XH')	10.5x10x3.75	5.4x11.5x6.5	14x8x3.5	14x8x3.5	6.125x9x4.75	3.5x8x6.5	8x6.5x3.5	5.4x11.5x6.5
WEIGHT (Lbs)	11	13	18	18	9	7	7	13
PRICE	**$124.95**	**$129.95**	**$179.95**	**$229.95**	**$69.95**	**$84.95**	**$79.95**	**$97.95**

ELENCO VARIABLE VOLTAGE POWER SUPPLIES ELENCO

OUR BEST SELLING VARIABLE POWER SUPPLY


ELENCO PRECISION
QUAD POWER
FOUR LINEAR REGULATED SUPPLIES

FEATURES:

- 4 DC voltages
  - 3 fixed: +5V @ 3A
    +12V @ 1A
    -12V @ 1A
  - 1 varible: 2.5 - 20V @ 2A
- Fully regulated and short protected
- Voltage and current meters
- All metal case
- Ideal for laboratory, service shops and hobbyists.
- Low cost and high value

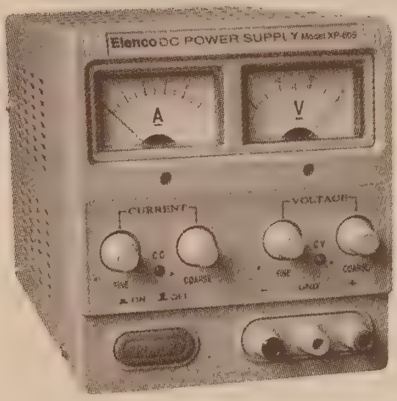
MODEL XP-581 .... $79.95

SPECIFICATIONS

Input Voltage	120VAC 60Hz			
Current Protection	2A Fuse			
Output Voltage	Fixed +5V	Fixed +12V	Fixed -12V	Variable 2.5-20V
Output Current	3A	1A	1A	1.5A @20V 2A @ 15V 1.5V @ 5V
Load Regulation	.1V	.1V	.1V	.1V
Line Regulation	.1V	.1V	.1V	.1V
Ripple RMS	.01V	.01V	.01V	.01V
Current Protection	Foldback	Thermal	Thermal	Foldback

ModelXP-605......$97.95

0-30V@ 5A

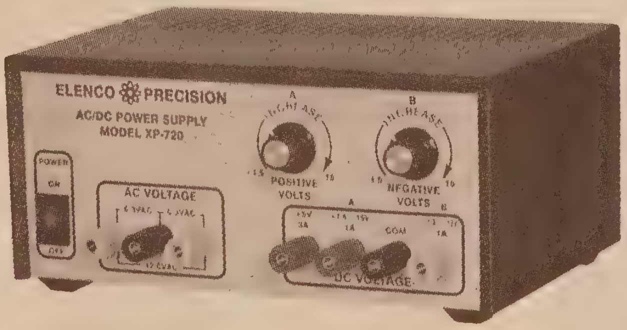

Elenco DC POWER SUPPLY Model XP-605
A
V
CURRENT
VOLTAGE
CC
CV
FINE
COARSE
FINE
COARSE

The **XP-605** has an output of 30VDC@5A. Its features include fine and coarse controls for voltage and current, and contains two analog Volt/Current meters.

The supply incorporates an externally controlled current cutoff circuit with an LED indicating current overload. Protected against short circuits and overloads.

MODEL XP-603 .... $89.95

Model XP-603 is a fully regulated 0-30 V DC output @ 3A. It features short circuit protection and variable current cutoff.

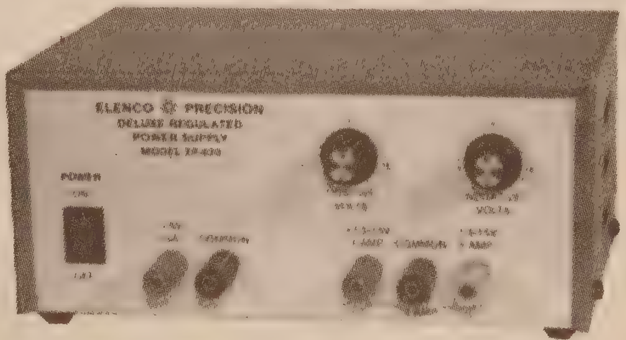

ELENCO PRECISION
AC/DC POWER SUPPLY
MODEL XP-720
POWER
ON
OFF
AC VOLTAGE
A
INCREASE
POSITIVE VOLTS
B
INCREASE
NEGATIVE VOLTS
DC VOLTAGE

Model XP-720 has 3 fully regulated supplies; 1.5-15V @1A, -1.5 to -15V @1A, or (3-30V @1A) and 5V @3A. It also has 6.3VAC @1A and 12.6 center tapped @1A. It features short circuit protection on all supplies.

XP-720 .... Assembled $84.95

AVAILABLE IN KIT

XP-720K .... KIT $59.95


ELENCO PRECISION
DELUXE REGULATED
POWER SUPPLY
POWER

Model XP-620 has 3 fully regulated supplies; 1.5-15V @1A, -1.5 to -15V @1A or (3-30V @1A) and 5V @ 3A. It features short circuit protection on all supplies.

XP-620 .... Assembled ... $79.95

AVAILABLE IN KIT

XP-620K .... KIT $49.95

Isolated Variable AC Power Supply

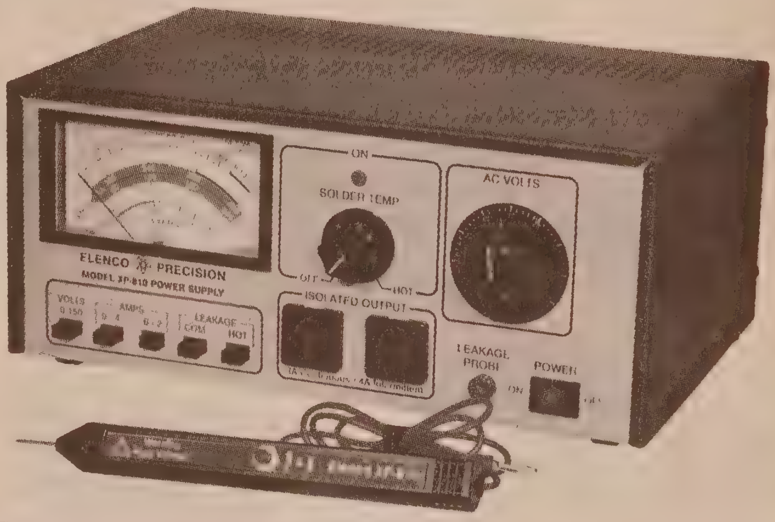
Model XP-810.......................................$349.95

Features:

- Variable Isolated Output (0 - 140VAC)
- Power Line Leakage Test
- Circuit Breaker
- Overload Protection
- Built-in Soldering Iron Temperature Control
- 2 Meter Range of 2A and 4A for Accurate Readings
- Built-in 4" Meter

SPECIFICATIONS	
Input Voltage	105 to 130 VAC.
Output Voltage Range	0 - 140 VAC at 120 VAC input.
Output Current	3 amp continuously or 4 amp intermittently. Intermittent current should not exceed 10 minutes on followed by 10 minutes off.
Output Isolation	Leakage less than 100 micro amps at 25° C, 50% related humidity.
METER SCALES	
Voltage	0 - 150 V.
Current	0 - 2 A, 0 - 4 A.
Volt-Amps	0 - 240 VA, 0 - 480 VA.
Leakage	0 to 5 mA (5,000 µA), expandable scale.
METER ACCURACY (25° C)	
Volts	±3% of full scale (calibrated @ 120 VAC).
Current	±5% of full scale.
Leakage	±5% @ 500 µA.
Soldering Iron Temperature control - 60% to 99% of AC power line , 100 watts max.	
Operating temperature	0° C to +40° C.
Storage Temperature	- 30° C to +60° C.
Dimensions (W x H x D)	11 1/2" x 5 1/2" x 7 3/4"
Weight	20 lbs (5.44 kg).

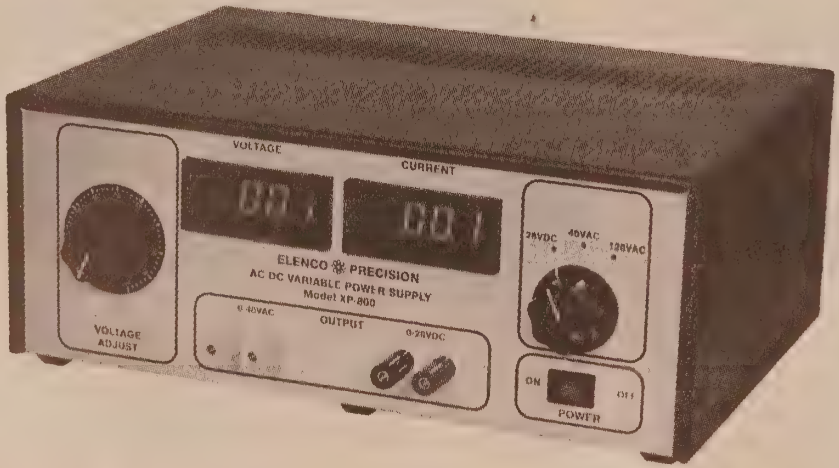
The XP-810 is an isolated-variable AC power supply. The voltage output is 0 - 140VAC at 3 amps continuous or up to 4 amps intermittently. The unit has a built-in isolation transformer for safe servicing of "hot chassis sets". The unit features a four inch meter to monitor voltage and current. The Model XP-810 also has a triac circuit to vary the voltage to a soldering iron, keeping it at any desired temperature.



High Current Variable Power Supply

Model XP-800.......................................$279.95

The XP-800 is a high current power supply with 3 variable outputs. Choose from either 0 - 120VAC @ 2A, 0 - 40VAC @ 7A or 0 - 28VDC @ up to 10A. The precision LED displays allow for exact readout of volts and current. The XP-800 is ideal for Principles of Technology experiments in schools or it can be used as a bench power supply in OEM labs.

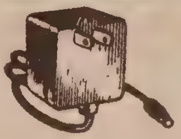


Features:

- 3 variable outputs
- Precision LED readouts
- Circuit breaker protection
- Ideal for schools or OEM's

SPECIFICATIONS	
Input	
Input Voltage	120VAC
Current Protection	5A Fuse
28VDC Supply	
Output Current	10A max.
Output Voltage	28VDC max. for light loads 20VDC max. for 10A load
Ripple	Less than 0.2V rms at 10A load
Current Protection	10A Circuit Breaker
Meter	0 to 28VDC, 0.1V resolution 0 to 10A, 0.1A resolution
40VAC Supply	
Output Current	7A max.
Output Voltage	40VAC max. for light loads 38VAC max. for 5A load
Ripple	Less than 0.2V rms at 10A load
Current Protection	3A Circuit Breaker (on transformer primary)
Meter	0 to 40VAC, 0.1V resolution 0 to 7A, 0.1A resolution
120VAC Supply	
Output Current	2A max.
Output Voltage	120VAC max.
Current Protection	3A Circuit Breaker
Meter	0 to 120VAC, 1V resolution 0 to 2A, 0.1A resolution

AC/DC ADAPTERS, VARIACS & INVERTERS



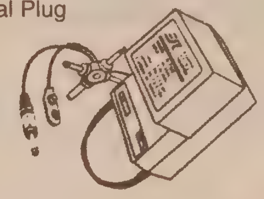
Quality AC/DC adapters. Not cheap surplus. UL & CSA approved. Plug is 3.5mm unless otherwise noted. All inputs 120 VAC. User can cut off plug and replace with type needed. See page 105 for other types of plugs.

AC TO DC ADAPTERS				
PART NO	OUTPUT VOLTS		MAX. CURRENT	PRICE
WT45-731	3V	DC	100mA	6.95
WT45-745	4.5V	DC	500mA	7.40
WT45-756	6V	DC	300mA	7.50
WT45-757	9V	DC	300mA	7.50
WT45-765	9V	DC	500mA	7.50
WT45-761	12V	DC	500mA	7.95
WT45-763	12V	DC	800mA	8.95
WT45-783	18V	DC	300mA	7.95
WT45-773	18V	DC 2.1mm	500mA	8.95
WT45-767	24V	DC	400mA	8.95

AC TO AC ADAPTERS				
PART NO	OUTPUT VOLTS		MAX. CURRENT	PRICE
WT45-776	9V	AC 2.1mm	1 Amp	7.95
WT45-768	12V	AC	830mA	6.95
WT45-764	16V	AC 2.1mm	1.1 Amp	8.95
WT45-414	18V	AC	300mA	9.95

Multivoltage AC/DC Adapter 500mA

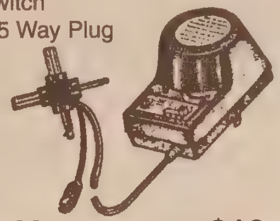
Input 120VAC
Output 3V, 4.5V, 6V, 7.5V, 9V and 12V DC
Polarity Switch
Universal Plug



45-753.................$8.95

Multivoltage AC/DC Adapter 800mA

Input 120VAC
Output 3V, 4.5V, 6V, 7.5V, 9V and 12V DC
Polarity Switch
Universal 5 Way Plug



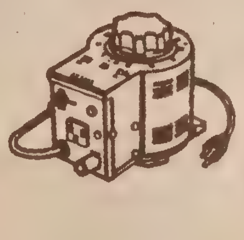
BE-240.................$13.95

VARIABLE VOLTAGE AC POWER SUPPLY "VARIAC"

An important and often overlooked piece of test equipment. Excellent when repairing old radios where you would want to increase the AC voltage slowly to minimize or avoid any damage to the radio. Isolation provides shock protection from ungrounded radio or device.

VARIABLE OUTPUT VOLTAGE REGULATOR

Adjustable output from AC line, 0 to 130 volts. input 117 volts, 5 Amps. Current rating apply over full range of output voltage.



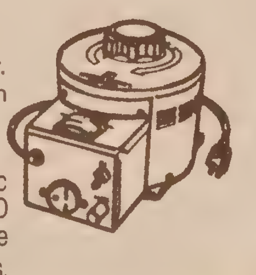
Specifications

Dimensions........6½" diameter (Including Terminals)
6½" deep (Knob to Base)

45-740............................$89.95

VARIABLE OUTPUT VOLTAGE REGULATOR

5 amp isolated supply w/ volt meter. Fuse protected with On/Off switch and AC volt meter scale 0-150 Vac.

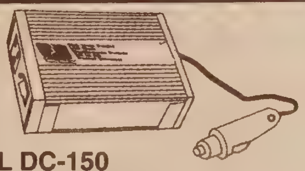


Specifications

Input Voltage..................................110-120 Vac
Dimensions...........................5"W x 6.5"H x 6.75"D
Output Voltage ....0-130 Vac, adjustable
Weight...10lbs.

45-741............................$159.95

DC TO AC POWER INVERTERS



MODEL DC-150
150 WATTS CONTINUOUS

Specifications:

Power Input:	12V DC
Power Output:	100V-120V AC
Continuous Power:	150 Watts
Peak Power:	200 Watts
Output Freauency:	60Hz + 1%
Output Wave Form:	Modified Sine Wave
Efficiency:	90%
No Load Current:	<250mA
Size:	2"H x 4.75"L x 5"W
Weight:	1 lb. 6 oz.

DC-150.........................$49.95

DC to AC POWER INVERTERS

***NOW*, house current from your car/truck/RV boat... without a generator**

When the power fails run an extension cord into your house and plug in the lamp and the TV. Also great for camping trips, tailgate parties and outdoor chores. These inverters can run; Amateur Radio Transceivers plus...

- •Battery chargers
- •Drills
- •Lights
- •Sanders
- •Tape Recorders
- •Blenders
- •Fans
- •Massagers
- •Shavers
- •Televisions
- •Computers
- •Guitar amps
- •Pumps
- •Soldering irons
- •TV games
- •Curling irons
- •Jigsaws
- •Radios
- •Stereos
- •VCRs

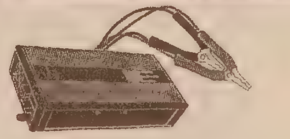
BATTERY DRAIN: A 13" color TV uses about as much energy as one headlight. Your battery can probably deliver that much energy over six hours.

Built into both units are a number of important features such as low battery warning, overload protection, overheat protection and both are fused. Be sure to operate only devices that do not exceed the power ratings of these supplies. 1 Year Warranty.

ATTENTION HAMS

THIS IS A GREAT FIELD DAY ITEM

NO MORE GAS GENERATORS!



MODEL DC-300
300 WATTS CONTINUOUS

Specifications:

Power Input:	12V DC
Power Output:	100V-120V AC
Continuous Power:	300 Watts
Peak Power:	500 Watts
Output Freauency:	60Hz + 1%
Output Wave Form:	Modified Sine Wave
Efficiency:	90%
No Load Current:	<250mA
Size:	2.3"H x 6.5"L x 6.5"W
Weight:	1 lb. 6 oz.

DC-300.........................$64.95

ELENCO DIGITAL / ANALOG TRAINER ELENCO

A low cost, full-function digital/analog trainer that meets the needs of electronic training programs. Rugged construction, can be used as fixed lab equipment or be portable. An economical zipper case is available.

SPECIFICATIONS

DIGITAL SECTION

- Eight data switches.
- Two no bounce logic switches.
- Eight LED readouts, buffered.
- Clock frequency 1Hz, 1kHz, 100kHz, 60Hz.
- Clock amplitude 5Vpp square wave.

ANALOG SECTION

- Function Generator - Sine, Square Wave
- Frequency adjustable in two ranges from 200 - 40k
- Amplitude Sine 4Vpp
- Square 12Vpp

POTENTIOMETERS

- 2 undedicated potentiometers 1kΩ & 100kΩ.

POWER SUPPLIES

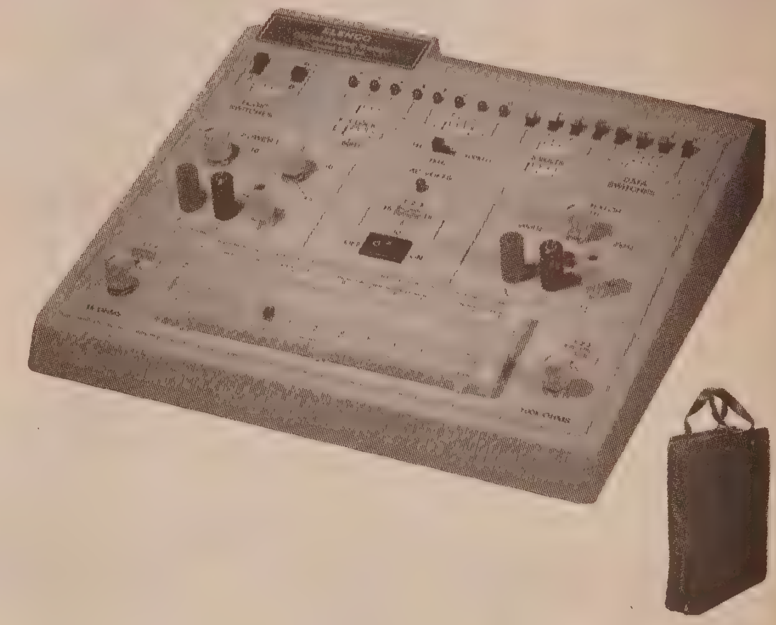
- Variable Power Supply.
- +1.25V to 15VDC @ .25 amp.
- -1.25V to -15VDC @ .25 amp.
- +5VDC @ .25 amp.
- +30VAC center tapped at 15VAC @ .25 amp.

CASE

High impact molded case 11" (L) x 11" (W) x 2" (H). With flow-thru cooling to ventilate the power supply.

BREDBOARDS

- 1 Bredboard, 830 tie points including 2 bus strips.



• Model XK-150 Digital Trainer - Available fully assembled..........$99.95

OPTIONAL ACCESSORY:

C-150 large zipper case with handles (13" x 11 3/4" x 3") to easly carry the XK-150 Digital/Analog Trainer..........$19.95

COMPUTER INTERFACE TRAINERS

Micro-Master® - A Basic Computer Training Kit to Learn the Fundamentals of Computers

Model MM-8000K..........$119.95

Starting from scratch, you build a complete computer system. Our Micro-Master® Trainer teaches you to write into RAMs, ROMs, and run an 8085 microprocessor. You will write the initial instructions in permanent memory in a 2816E²PROM. Teaches all about input and output ports and computer timers. Complete with 128 page lesson manual, instructions, and experiments.

Basic Parts Kit

Perfect for Student

Model CK-1000............$69.95

Plastic Parts Container
11" x 7" x 1 1/2" - 18 divisions

Resistors: 1/4W - 5 each
10Ω, 100Ω, 470Ω, 1kΩ, 2.2kΩ, 4.7kΩ, 8.2kΩ, 10kΩ, 18kΩ, 27kΩ, 47kΩ, 82kΩ, 100kΩ, 220kΩ, 330kΩ, 470kΩ, 1MΩ

Electrolytic Capacitors: 50V Radial - 2 each
1µF, 4.7µF, 10µF, 47µF, 100µF, 470µF, 1000µF

Mylar Capacitors: 100V Radial DIP - 2 each
.001µF, .0047µF, .01µF, .047µF, .1µF, .33µF

Ceramic Disc Capacitors: 500V - 2 each
2.2pF, 4.7pF, 10pF, 1pF, 22pF, 47pF, 100pF, 220pF, 470pF, 680pF

Inductors: 1 each
4.7µH, 10µH, 47µH, 100µH, 470µH, 1mH, 10mH, 33mH

Trimpots: Single Turn - 1 each
500Ω, 1kΩ, 5kΩ, 50kΩ, 100kΩ, 500kΩ, 1MΩ

Switches: 2 each
Pushbutton, SPDT slide, DPDT slide, 8-position DIP

LEDs: Standard T 1 3/4 size - 5 each
Red, Green, Yellow

Displays: 2 each
7-segment common cathode, 7-segment common anode

Integrated Circuits: 2 each
7805, 7812 Regulators, LM386 Audio Amp, 555 Timer, 741 Op-Amp, 74LS00, 74LS02, 74LS08, 74LS10, 74LS47, 74LS74, 74LS86, CD4013, CD4017

Transistors: 2 each
PN2222, PN2907, 2N3055, 2N3904, 2N3906, 2N5457

Diodes: 2 each
1N4148, 1N4001, 1N34, 1N4728, 1N4733, 1N4739, 1N4743, 1N4747

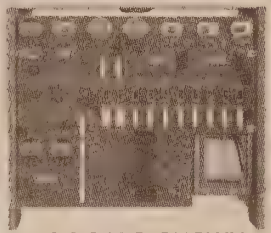
Miscellaneous:
25' 22AWG Hook-up wire, Alligator lead sets (red and black), 5V DIP relay, Photo cell, Microphone, Speaker, Buzzer, 9V battery snap, 1.5A 100V bridge, 4A 200V SCR

ELENCO DIGITAL/ANALOG TRAINERS ELENCO

MODELS XK-550 AND XK-700

Elenco's advance designed Digital/Analog trainer is specially designed for school projects, it is built on a single PC board for maximum reliability. All componets on one PC board eliminates all wires between boards,pots and switches. makes assembly much eaiser and eliminates errors. It includes 5 built in power supplies, a fuction generator with continously variable, sine, traingular, square wave forms. All power supplies are regulated and protected against shorts.

Shown below is our analog trainer with our newest organiser case at no cost. The tools shown with the trainer are the most common used in the educational field. You can make your own selection of tools and meter to go with the trainer.



PC BOARD SHOWN

SPECIFICATIONS XK-550 & XK-700

POWER SUPPLIES

- Variable Power Supply
- +1.25V to 20VDC @ .5 amp (+1.25V to 15VDC @ 1 amp)
- –1.25V to –20VDC @ .5 amp (–1.25V to –15VDC @ 1 amp)
- +12VDC @ 1 amp
- –12VDC @ 1 amp
- +5VDC @ 1 amp
- 30VAC center tapped at 15VAC @ 1 amp

ANALOG-SECTION

- Function Generator – Sine, Triangular, Square wave forms
- Frequency adjustable in five ranges from 1 to 100KHz
- Fine frequency adjust
- Amplitude adjust
- DC offset
- Modulation FM or AM

DIGITAL-SECTION

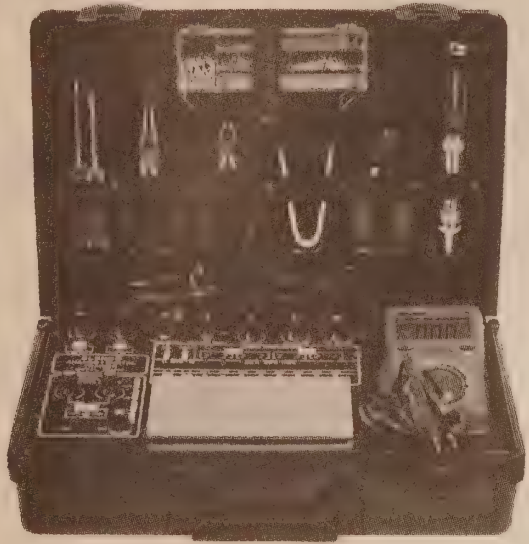
- Eight data switches
- Two no bounce logic switches
- Eight LED readouts, buffered
- Clock frequency 1 to 100KHz
- Clock amplitude 5VPP square wave

BREADBOARDS

- 2 Breadboards containing 1,560 tie points

POTENTIOMETERS

- 2 undedicated potenitiometers 1K ohm & 100K ohm



MODEL XK-550T (SHOWN IN PHOTO WITH TOOLS)

High impact molded organizer carrying case with pivot hinges and double latches 16 1/4" L x 12"W x 5 5/8"H. With flow thru cooling to ventilate the power supply.

- **Screwdriver Slotted 3/16"**
- **IC Puller**
- **Wire Stripper**
- **Screwdriver #1 Philips**
- **Long Nose Pliers**
- **JW-140 - Jumper Wire Kit**
- **Diagonal Pliers**
- **Solder Pump**
- **Anti Static Foam Pad**

(METER SOLD SEPERATELY • SEE PAGE 5 FOR METERS)

MODEL XK-550 **DIGITAL TRAINER $149.95**
Fully assembled without tools.

MODEL XK-550K **DIGITAL TRAINER $129.95**
Kit form. No tools included.

MODEL XK-550T **DIGITAL TRAINER $169.95**
Assembled, With tools included.

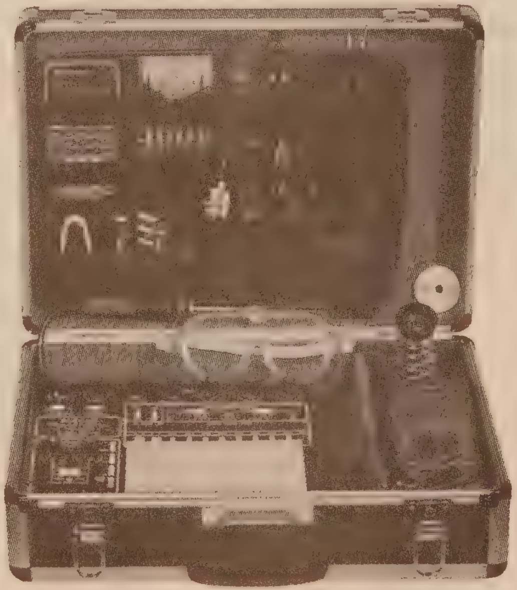
MODEL XK-550TK **DIGITAL TRAINER $139.95**
Kit form. Tools included.

MODEL XK-700 (SHOWN IN PHOTO WITH TOOLS)

The trainer is mounted in a professional technician tool case made of reinforced metal with heavy duty handles and locks. The removable, dual-sided tool pallet has many pockets and elastic retainers to hold a broad line of tools and devices. A special ramp in the case will hold the meter of your choice. Five adjustable dividers are provided if you desire to turn the case into a technician service case. Case size 18" x 13" x 6 1/2"

- **11 pc. Driver Set**
- **Diagonal Cutters**
- **Solder Wick**
- **Solder Ease Kit**
- **Long Nose Pliers**
- **IC Puller**
- **Soldering Iron Stand**
- **Solder Tube**
- **Precision Screwdriver set**
- **Solder Pump**
- **Safety Goggles**
- **Deluxe Soldering Iron**
- **Deluxe Wire Stripper**

(METER, CALCULATOR, AND LOGIC PROBE NOT INCLUDED)



MODEL XK-700 **DIGITAL TRAINER $169.95**
Fully assembled without tools.

MODEL XK-700K **DIGITAL TRAINER $139.95**
Kit form. No tools included.

MODEL XK-700T **DIGITAL TRAINER $195.95**
Assembled, With tools included.

MODEL XK-700TK **DIGITAL TRAINER $159.95**
Kit form. Tools included.

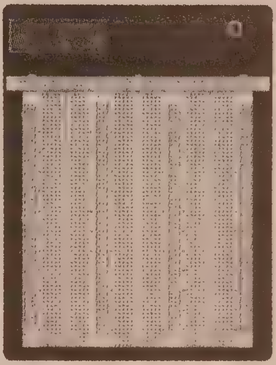
ELENCO BREDBOARD -PROTOTYPE DESIGN AIDS ELENCO

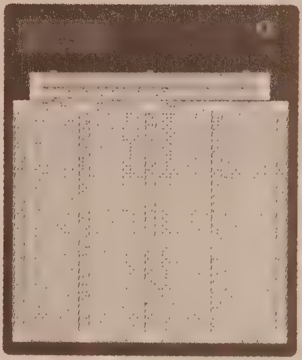
A broad array of bredboards that provide unlimited freedom in laying out circuits and prototyoping. Bredboards are arrayed from 200 tie points up to 3,920 tie points with colored binding posts that simplify identication of voltage points.

MODEL 9438

TERMINALS: 2,390 test points, 378 separate 5 point terminals, plus 20 horizontal bus lines of 25 common test points each.
CAPACITY: Up to 33, 14 pin or 30, 16 pin dip ICs.
BINDING POSTS: Four coded black, red, yellow and green.
BASE MATERIAL: Heavy aluminum black anodized
SIZE: 7" wide, 9" long.
WEIGHT: 15 oz.

9438 .... $26.95

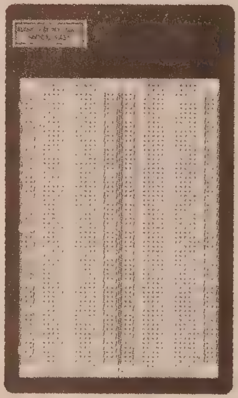




MODEL 9440

TERMINALS: 3,920 test points, 504 separate 5 point terminals, plus 14 horizontal bus lines of 25 test points each.
CAPACITY: Up to 36, 14 pin dip ICs.
BINDING POSTS: Four coded black, red, yellow and green.
BASE MATERIAL: Heavy aluminum black anodized
SIZE: 8-1/4" wide, 9-1/2" long.
WEIGHT: 1lb 2 oz.

9440 .... $35.95



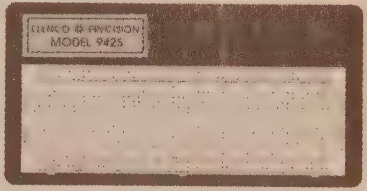
MODEL 9433

TERMINALS: 1,660 test points, 252 separate 5 point terminals, plus 16 horizontal bus lines of 25 common test points each.
CAPACITY: Up to 18, 14 pin or 15, 16 pin dip ICs.
BINDING POSTS: Three coded black, red and green.
BASE MATERIAL: Heavy aluminum black anodized
SIZE: 5-1/4" wide, 8-1/2" long.
WEIGHT: 10 oz.

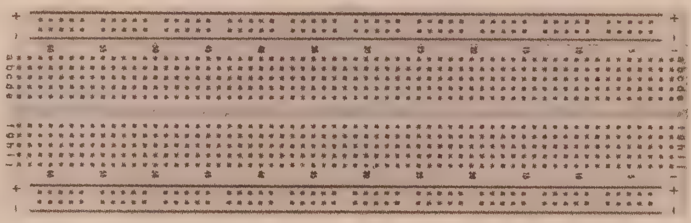
9433 .... $19.95

MODEL 9425

TERMINALS: 830 test points, 126 separate 5 point terminals, plus 8 horizontal bus lines of 25 common test points each.
CAPACITY: Up to 11, 14 pin or 30, 16 pin dip ICs.
BINDING POSTS: Three coded black, red and green.
BASE MATERIAL: Heavy aluminum black anodized
SIZE: 7-1/4" wide, 3-3/4" long.
WEIGHT: 6 oz.



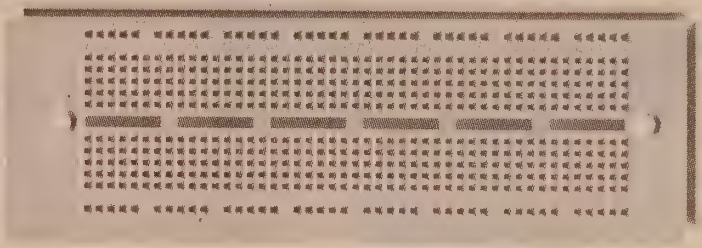
9425 ....$12.95



MODEL 9830

Our top quality bredblox contains 830 tie points with four independent common bus lines for easy connections to common lines. Numbers and letters are printed in black, bus lines in red and blue. Snap lock permits unlimited interlocking of additional boards.

9830 .... $8.95



MODEL 9550

The 9550 contains 550 tie points including two power bus lines. This blox can be expanded with our interlocking feature and can be snaped into the function bloxs. Max wire size #22. 6" x 2-1/8"

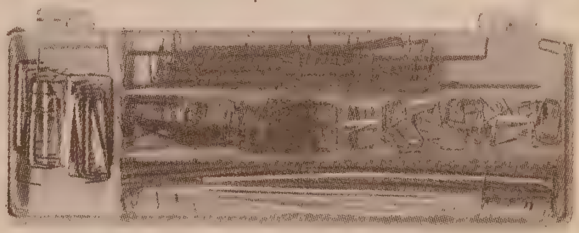
9550 .... $7.95

Jumper Wire Kits for Bredboarding

MODEL JW-350

Contains 350 lengths of pre-stripped, preformed #22 solid wire in various colors. 14 different lengths of 25 pieces each. Contained in a large 14 compartment plastic case (10 1/2" x 5" x 1-1/4").

JW-350 .... $8.95



MODEL JW-140

Contains 140 lengths of pre-stripped, preformed #22 solid wire in various colors. Contains 14 different lengths of 10 pieces each. Contained in a plastic case (6 1/2" x 2" x 1/2").

JW-140 .... $5.95

ELENCO TRAINING COURSES AND PROTOTYPING ELENCO

Basic Electronic Experiments Model PK-101...........$19.95

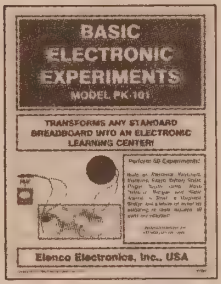
Transforms any Standard Bredboard into an Electronic Learning Center!

Perform 50 Experiments

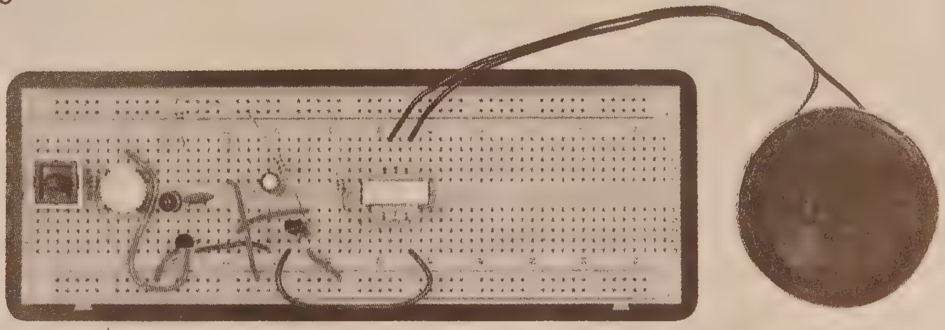
- Electronic Keyboard
- Finger Touch Lamp
- Metal Detector
- Burglar Alarm
- Battery Tester
- Voltmeter
- Water Alarm
- Siren
- Space Gun
- Electronic Kazoo
- Magnetic Bridge
- Morse Code

*** And a Lot More! ***

The experiments in Model PK-101 require a bredboard or can be done on the Elenco XK-150, XK-550 or XK-700 Trainers. No soldering or tools required, all parts included.


BASIC ELECTRONIC EXPERIMENTS
MODEL PK-101
TRANSFORMS ANY STANDARD BREADBOARD INTO AN ELECTRONIC LEARNING CENTER!
Perform 50 Experiments!
Elenco Electronics, Inc., USA

72 Page Manual Included


(Requires bredboard and a 9V battery or power supply.)

Basic Parts Kit

Perfect for Student

Model CK-1000............$69.95

Plastic Parts Container
11" x 7" x 1 1/2" - 18 divisions

Resistors: 1/4W - 5 each
10Ω, 100Ω, 470Ω, 1kΩ, 2.2kΩ, 4.7kΩ, 8.2kΩ, 10kΩ, 18kΩ, 27kΩ, 47kΩ, 82kΩ, 100kΩ, 220kΩ, 330kΩ, 470kΩ, 1MΩ

Electrolytic Capacitors: 50V Radial - 2 each
1µF, 4.7µF, 10µF, 47µF, 100µF, 470µF, 1000µF

Mylar Capacitors: 100V Radial DIP - 2 each
.001µF, .0047µF, .01µF, .047µF, .1µF, .33µF

Ceramic Disc Capacitors: 500V - 2 each
2.2pF, 4.7pF, 10pF, 1pF, 22pF, 47pF, 100pF, 220pF, 470pF, 680pF

Inductors: 1 each
4.7µH, 10µH, 47µH, 100µH, 470µH, 1mH, 10mH, 33mH

Trimpots: Single Turn - 1 each
500Ω, 1kΩ, 5kΩ, 50kΩ, 100kΩ, 500kΩ, 1MΩ

Switches: 2 each
Pushbutton, SPDT slide, DPDT slide, 8-position DIP

LEDs: Standard T 1 3/4 size - 5 each
Red, Green, Yellow

Displays: 2 each
7-segment common cathode, 7-segment common anode

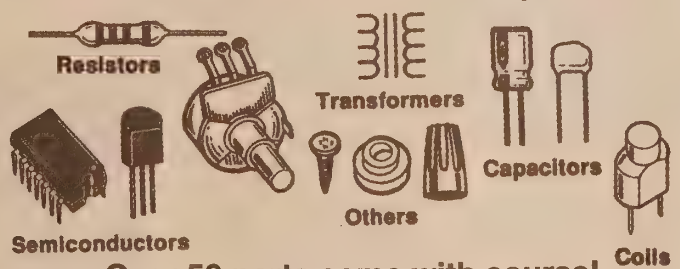
Integrated Circuits: 2 each
7805, 7812 Regulators, LM386 Audio Amp, 555 Timer, 741 Op-Amp, 74LS00, 74LS02, 74LS08, 74LS10, 74LS47, 74LS74, 74LS86, CD4013, CD4017

Transistors: 2 each
PN2222, PN2907, 2N3055, 2N3904, 2N3906, 2N5457

Diodes: 2 each
1N4148, 1N4001, 1N34, 1N4728, 1N4733, 1N4739, 1N4743, 1N4747

Miscellaneous:
25' 22AWG Hook-up wire, Alligator lead sets (red and black), 5V DIP relay, Photo cell, Microphone, Speaker, Buzzer, 9V battery snap, 1.5A 100V bridge, 4A 200V SCR

Before You Learn Electronics
Learn About Electronic Components



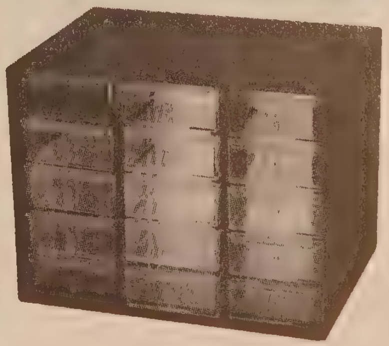
Over 50 parts come with course!

Manual includes detailed description of all parts, their functions in a circuit, color codes, specs and 5 self tests

ECK-10 .... $7.95

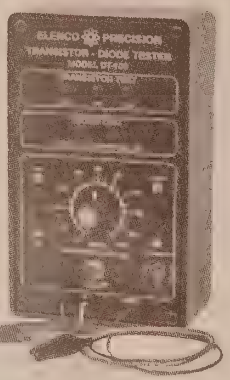
Parts Storage Box

PSB-15 .... $14.95


7" (H) x 9" (W) x 6.5" (D); 15 drawers

ELECTRONIC PROJECT KITS

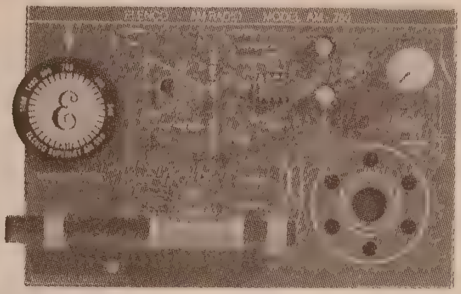
Diode/Transistor Tester Kit
DT-100K....................$24.95



This dynamic tester allows checking of transistors and diodes in circuit. Identifies NPN or PNP transistors. Checks all types small or large power. Idetifies anode or cathode of diodes.

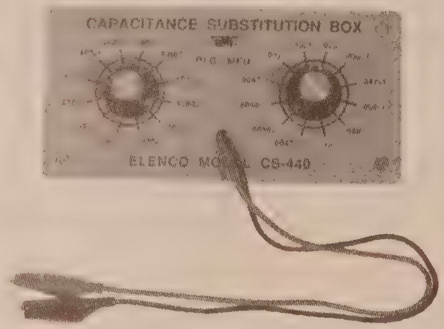
Also Available Assembled
DT-100.......................$34.95

2 IC AM Radio Kit
Model AM-780K....................$13.95



New Design - Easy-to-Build complete radio on a single PC board. Unique design allows you to place parts over its corresponding symbol on the PC board. Teaches the basic theory of AM radio operation. Detailed instructions and illustrations make it an easy and educationally sound project.

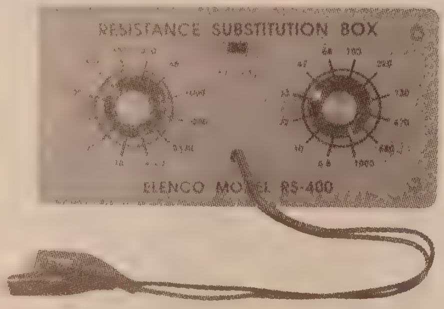
CAPACITOR SUBSTITUTION BOX
K-38...$14.95



This easy to assemble kit contains 24 different value capacitors from 100pf to .1MFD.

Available assembled
CS-440...$21.95

RESISTOR SUBSTITUTION BOX
K-37...$14.95



This easy to assemble kit contains 24 different value resistors from 10 ohms to 1M ohms.

Available assembled
RS-400...$21.95

AMATEUR RADIO RECEIVER KIT
Model AR-2N6K Kit.................................. $34.95

ELENCO AR-2N6

FM Receiver Kit and training course, ideal for beginners. Easy to build and learn about amateur radio.

- Covers both 2 meter (144-148MHz) and 6 meter (50-54MHz) FM
- Dual conversion superheterodyne
- Loud speaker output.
- Squelch control
- Internal 9V battery
- Includes all parts, case, schematics, assembly and training manual.

LEARN SURFACE MOUNTING TECHNIQUES
Function Generator Kit with Training Course
Model FG-600K $39.95

SPECIFICATION

OUTPUT:
Waveforms: Sine, Square, Triangle
Frequency: 0.1-1MHz
Impedance: 600Ω ± 10%
Amplitude: Sine/Triangle 0-3V at 12V DC input Squarewave .5-12V (no lead)
Frequency Variable Range: 100:1 or more
Frequency Multiplier: x1, x10, x100

SINE WAVE
Distortion: Less than 1%
Flatness: ±0.5 dB 1Hz-100KHz
Temperature Stability: ±20ppm/°C Typical

SQUARE WAVE
Symmetry: Less than 5% (at 1KHz)
Rise & Fall time: Less than 300ns (at 1KHz)

TRIANGLE WAVE
Linearity: Less than 1% (up to 100KHz)
Power Requirements: 9 to 18V DC at input

This versatile function generator includes surface mount components such as IC's, resistor and capacitors. When completed, it provides Sine, Square and Sawtooth waveforms, continuously variable 1Hz to 1MHz. Amplitude adjustable to 2.5V peak to peak. Complete with all parts and PC board. Deluxe case with handle and extensive training manual.

ELENCO ELECTRONICS
FUNCTION GENERATOR
MODEL FG-600

ELENCO RADIO KITS ELENCO

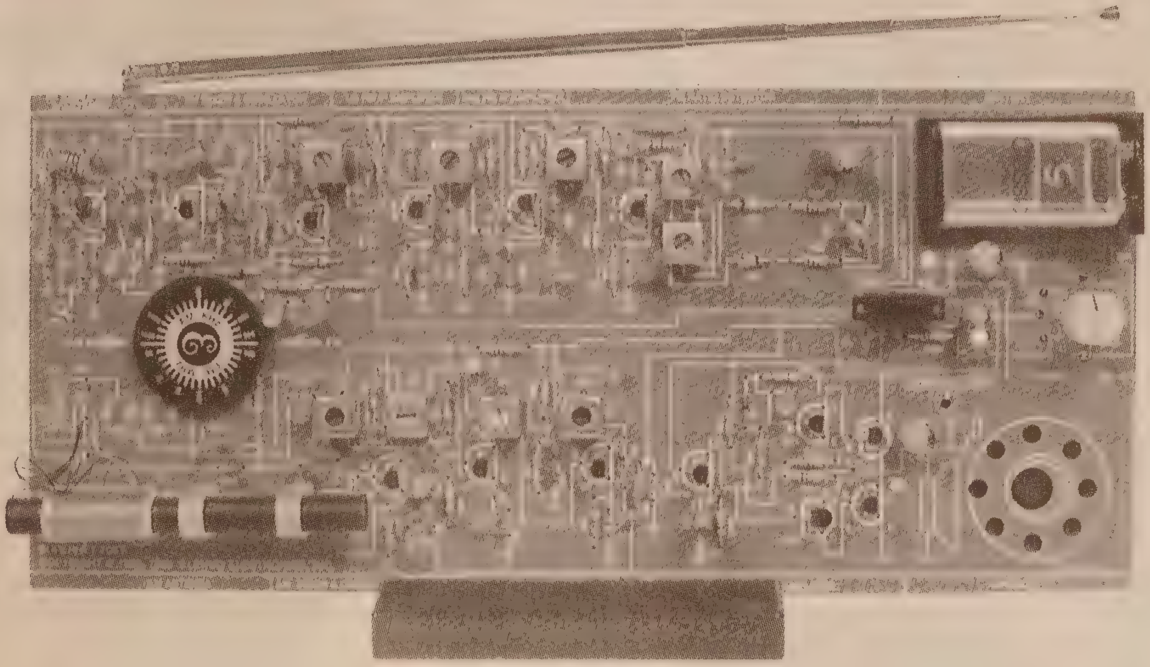
LEARN RADIO THEORY BY BUILDING THESE UNIQUE RADIO KITS

The unique design of these kits allows you to place the parts over its corresponding symbol in the schematic drawing on the surface of the printed circuit board during assembly. This technique maximizes the learning process while keeping the chances for an assembly error at a minimum.

AM/FM RADIO KIT AND TRAINING COURSE 14 Transistors and 5 Diodes
MODEL AM/FM-108.................................. $29.95

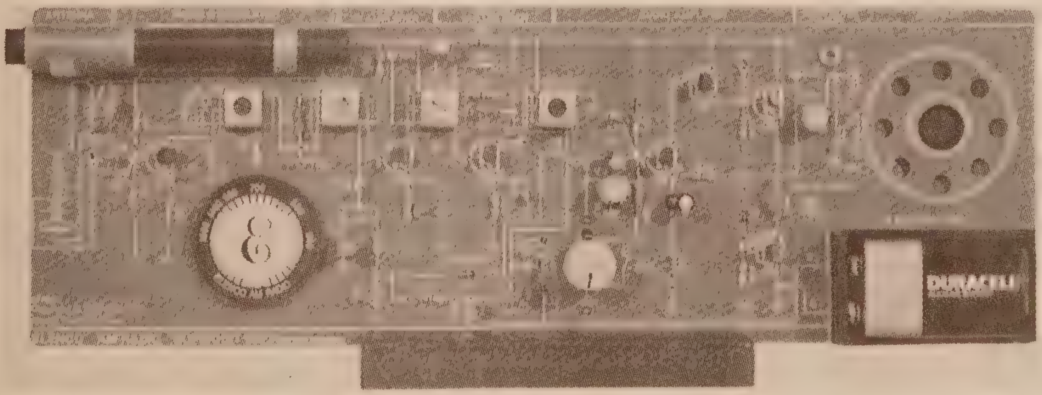
11 5/8" X 5 1/4" PC board, 52 page manual divided into 9 lessons; Audio Amplifier, AM Mixer & Oscillator, FM Detector, 1st FM IF, 2nd FM IF, FM RF Stages.

"Superheterodyne" receiver of standard AM (amplitude modulation) and FM (frequency modulated) broadcast frequencies.



7 - TRANSISTOR SUPERHET AM RADIO KIT MODEL AM-550............... $19.95

10 1/2" X 3 1/2" PC board, 28 page manual divided into 5 sections; RF, IF, Oscillator, Detector, and Audio Circuits. "Superheterodyne" receiver of standard AM (amplitude modulated) broadcast frequencies.



Both kits include an assembly, lesson and theory of operation manual. The actual assembly is broken into simple sections. Each section should be completely tested before moving on. This reduces difficult troubleshooting associated with many similar kits. Both include all components, battery, solder and practical hi-tech blue PC board, with schematic printed on the surface. The manual is easy to understand, no previous knowledge of electronics necessary. Each radio kit PC board has been so designed that no cabinet is necessary. A special bracket provides the necessary support to use the radio in any location, displaying the work achievement to the student.

MAKES AN EXCELLENT PROJECT FOR CLASSROOM STUDIES

Fiber Optics Kit with training course

Model FO-30K..$19.95

Learn the basics of fiber optics communications while you build this exciting kit. Transmit your voice or a 1kHz signal through the fiber optic cable to a fiber optic receiver. Comes complete with all of the necessary components, including PC boards, microphone, speaker and fiber optic cable. Transmitter and receiver on separate boards, can be located hundreds of feet apart. Requires 2-9V batteries not included.

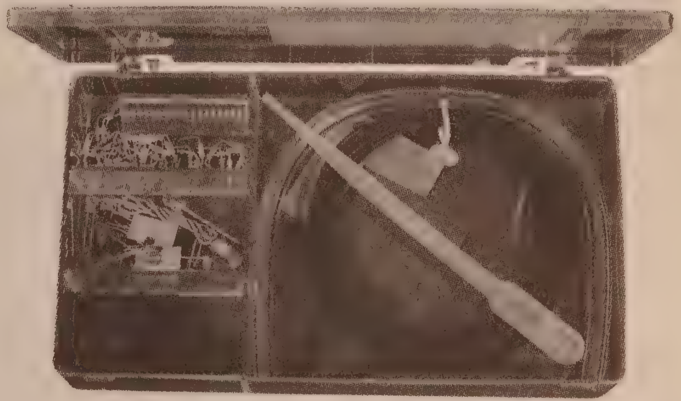
DURACELL
DURACELL

Fiber Optic Lab Kit

with training course

Model FO-40K.......$49.95

The course includes a 61 page manual and all of the material necessary to conduct nine stimulating experiments related to fiber optic communications. The experiments will give you a better understanding of fiber optics techniques and real fiber optics hardware.



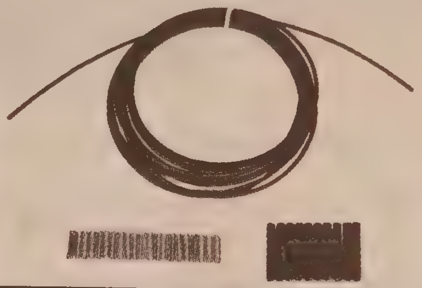
Fiber Optic Tool Kit

Model TK-50.........$146.95

For use on 1,000µm plastic fiber. With this kit there will be no nicked or damaged fibers. It contains a ***no nick fiber stripper***, hot knife cutting tool, termination fixture and carrying case.

Fiber Optic Splice Kit

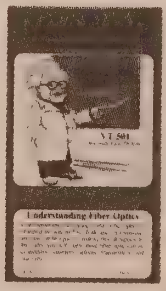
Model TK-25.................$9.95



For mending or extending 1,000µm plastic fiber. It contains fiber sleeves and retention clips to complete ten splices. No special tools, polishing or adhesive required. Instructions included.

Understanding Fiber Optics

Model VT-501............................$39.95



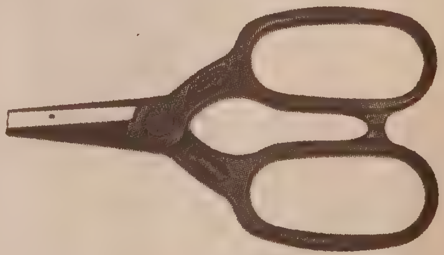
Learn tomorrow's technology today! Fiber optics is changing the way we live, think and communicate. You will learn about fiber optic cables, connectors, couplers, splicers, transmitters and receivers.
58 minutes viewing time.

Ceramic Kevlar◆ Cutter

Model ST-340.................$29.95

Easily trim Kevlar strength member in fiber optic cable. The ceramic blades cut Kevlar quickly and precisely.

Kevlar® is a registered trademark of the E.I. Dupont Company.



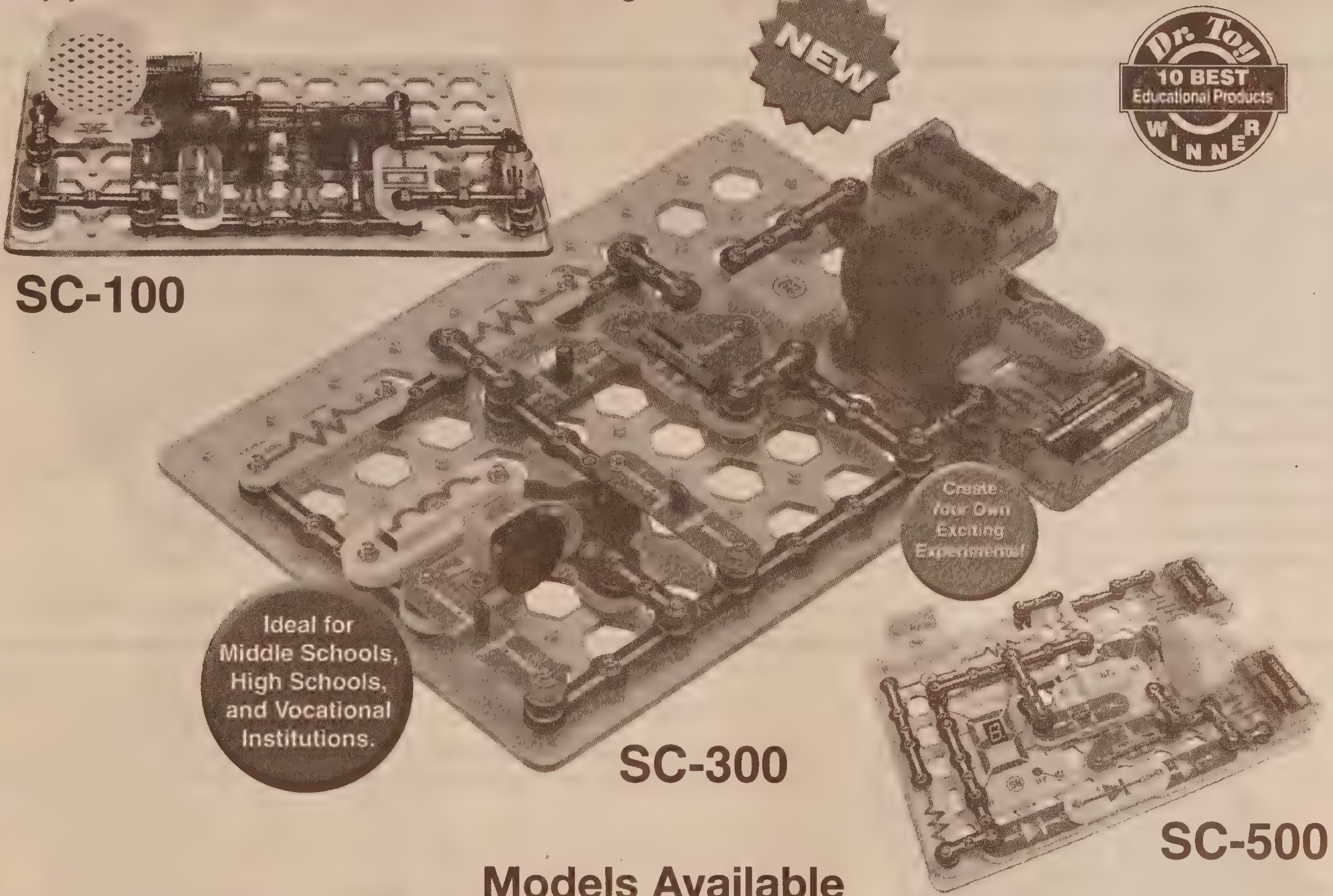
Fiber Optic Cable

Part # 810020 - 1,000µm Core Plastic Fiber Optic Cable - Sold per foot....................$.95/FT

Part # 810021 - Plastic Fiber Duplex Cable - sold per foot..$1.80/FT

SNAP CIRCUITS™ EDUCATIONAL TOYS

Elenco's new Snap Circuit™ Kits make learning electronics a "snap". Just follow the colorful pictures in our manual and build over 300 projects, such as AM radios, burglar alarms, flashlights, doorbells, and much more. You can even play electronic games with your friends! Contains over 60 parts that are mounted on plastic modules and snap together with ease. Enjoy hours of educational fun while learning about electronics. With our SC-300S deluxe version, you will also learn about and use an oscilloscope and spectrum analyzer, as you build over 20 bonus experiments using your Windows-based PC. Comes with all of the interface parts you need and the software. Great for introducing electronics through a computer.
No tools required. Uses "AA" batteries.


NEW
Dr. Toy
10 BEST
Educational Products
WINNER
SC-100
Create Your Own Exciting Experiments!
Ideal for Middle Schools, High Schools, and Vocational Institutions.
SC-300
SC-500

Models Available

SC-100 - *Snap Circuits Jr.™*, Contains over 30 parts. Build over 100 experiments	$22.18
SC-300 - *Snap Circuits Standard*, Contains over 60 parts. Build over 300 experiments	$44.88
SC-500 - *Snap Circuits Deluxe*, Contains over 75 parts. Build over 500 experiments	$69.95

UPGRADE YOUR EXISTING SNAP CIRCUITS TO THE NEXT LEVEL

UC-30 - SC-100 TO SC-300 UPGRADE KIT	$29.95
UC-40 - SC-100 TO SC-500 UPGRADE KIT	$59.95
UC-50 - SC-300 TO SC-500 UPGRADE KIT	$29.95

Optional Carry Case for Your SC-100, SC-300, or SC-500

Molded durable plastic case includes three fitted foam inserts for the kit components. Case measures 12"H x 17"W x 5 1/2"D

C300SC	$49.88

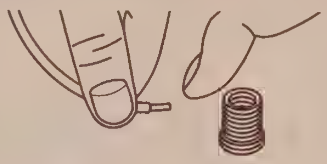
ELENCO ELECTRONIC SCIENCE & PROJECTS LAB ELENCO

NO TOOLS OR SOLDERING REQUIRED!

These "Electronic Science Labs" will teach you about electronics from A-Z. With these all-in-one labs, you'll learn about electronic parts, how to read schematics, and wiring diagrams. All this while building up to **500** different projects. These kits use two quick and easy hook-up methods:

Spring Method:

Simply slip pre-cut wires and components into special springs for a safe, secure connection.



Model EP-50........$19.95

Over 50 Electronic Projects

Build these exciting circuits:

- Finger touch lamp
- Magnetic bridge
- Voltmeter
- Morse code
- Alarm
- Electronic noisemaker
- Electronic kazoo
- Electronic keyboard
- Transistor radio
- Radio announcer
- Metal detector

Learn about:

- Voltage
- Current
- Resistors
- Capacitors
- Transistors
- Diodes
- Transformers
- Speakers
- Antennas

IDEAL FOR MIDDLE SCHOOLS

OVER 50 EXPERIMENTS

Specifically Designed for Beginners.

(Spanish Manual Available)

Requires 1 9V battery

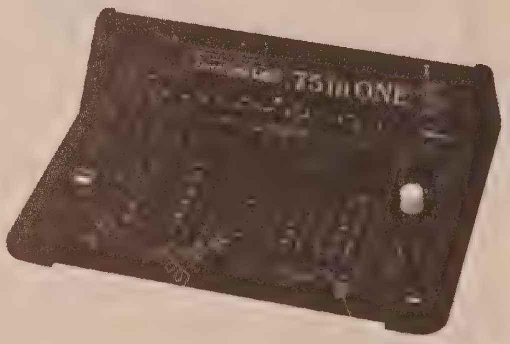
50 Exciting Experiments

Uses spring hook-up method

75-IN-ONE Electronic Project Lab

Model MX-905..............................$29.95

- Easy-to-read, illustrated, lab-style manual included.
- Learn basic principles of electricity, electronics, physics and magnetism!



Uses spring hook-up method

Requires 4 "AA" batteries

Everything You Need to Build:

- Timer Buzzer
- Sound Alarm
- Burglar Alarm
- Photo-level Alarm
- Logic Tester
- Electronic Coin Toss
- Motion LED
- Electronic Organ
- Motion Detector
- First-Aid Siren
- Pulse Width Modulation
- Water Level Alarm
- Sound Level Meter
- DC to DC Converter
- Sound-sensor Timer
- Four-level Photometer
- Two Stage Timer Sound
- Voltage Detector
- Conductivity Tester
- Optical Volume
- AND MANY, MANY MORE!

130-IN-ONE Electronic Project Lab

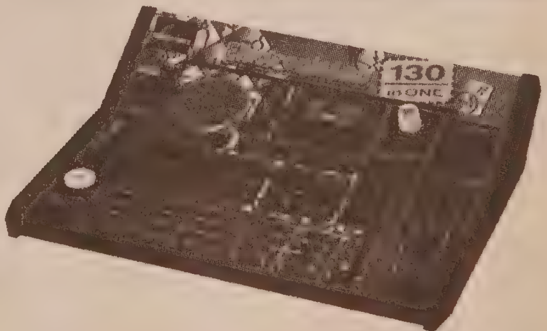
Model MX-906...............................$39.95

- Easy-to-read, illustrated, lab-style manual included.
- Learn basic principles of electricity, electronics, physics and magnetism!
- Comes with built-in speaker, 7-segment LED display, two fully integrated circuits and rotary controls.

Everything You Need to Build:

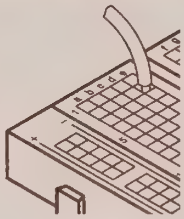
- AM Broadcast Station
- Electronic Organ
- Strobe Lights
- Timer
- Logic Circuits
- AND MUCH MORE

Requires 6 "AA" batteries



Uses spring hook-up method

ELENCO ELECTRONIC SCIENCE & PROJECTS LAB ELENCO



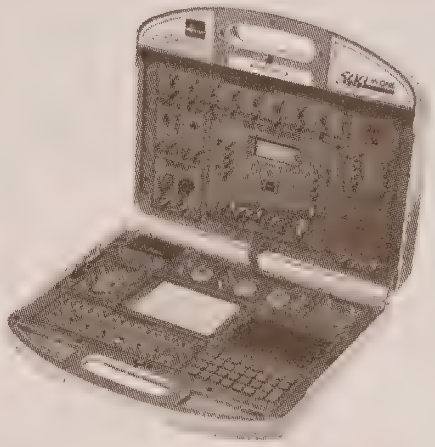
Breadboard Method:
Featured in our advanced kits, this system is used by professionals and engineers. Just plug the components and wires into the special breadboard socket holes.

No soldering is required. Everything uses safe battery power - no dangerous AC is required, so it's safe for all ages. Labs come with all components and wires needed to build each project. NO TOOLS ARE REQUIRED. No prior knowledge is needed to assemble and build these exciting projects. Easy-to-read, illustrated, lab-style manuals take you through each electronic experiment step-by-step. All are designed for ages 10 & up, so these are ideal for **MIDDLE SCHOOLS** and **HIGH SCHOOLS**.

500-IN-ONE Electronic Project Lab
Model MX-909...............................$139.95

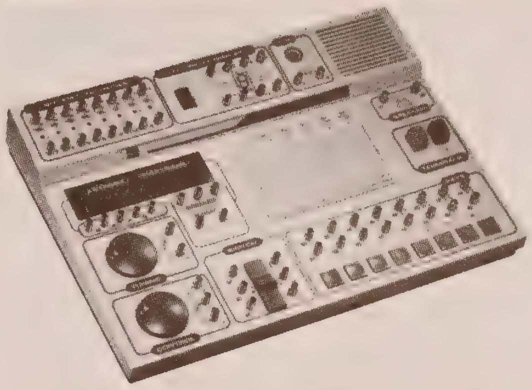
- Everything you need to build 500 Exciting Electronic Projects:
  - Learn the basics of electronics and put your knowledge to work creating 500 different electronic experiments, special lighting effects, radio transmitter and receivers, amazing electronic sound effects, cool games and MORE!
  - Includes built-in breadboard for easy wiring and connection of components, and an LCD (Liquid Crystal Display) indicates the information during the experiments in process!
  - Build your knowledge by exploring amplifiers, analog and digital circuits plus how to read schematic diagrams.
  - Includes transistors, transformers, diodes, resistors, capacitors, phototransistors, CDs, integrated circuits, speaker, earphone, LEDs, LED digit display!
- Fact-filled, illustrated, lab-style manual included.

Requires 6 “AA” batteries.



Uses breadboard and spring hook-up methods

300-IN-ONE Electronic Project Lab
Model MX-908.................................$69.95



Uses spring and breadboard hook-up methods

Everything You Need to Build 300 Exciting Electronic Projects:

- A Transistor Radio
- IC Organ
- Burglar Alarm
- Delayed Timer
- Electronic Game
- Optical Volume
- Multiplier
- Multiple Counter
- Digital Light Dimmer
- Tone Burst Generator
- Audio Signal Tracer
- Electronic Candle
- Voice Level Meter
- Metal Detector
- Rain Detector
- Voltage Drop Alarm
- Logic Checker
- Function Generator
- Voltage Controlled Amplifier
- AND MANY, MANY MORE!

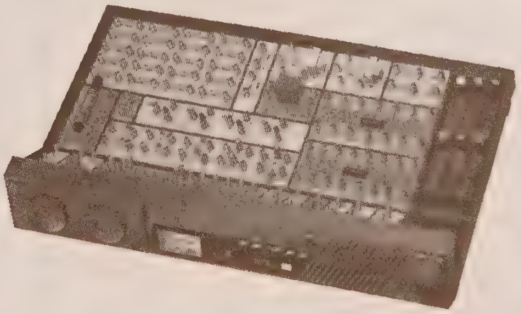
- Easy-to-read, illustrated, lab-style manual included.

Requires 6 “AA” batteries.

200-IN-ONE Electronic Project Lab
Model MX-907.................................$49.95

- Easy-to-read, illustrated, lab-style manual included.
- Learn about transistors, transformers, diodes, capacitors, oscillators, basic electronic circuits, and schematic symbols.
- Build your own Radio, AM Broadcast Station, Burglar Alarm, Electronic Game, Ohmmeter, Telegraph, Rain Detector, Amazing Sound Effects, and Much More!
- With built-in speaker, earphone, meter, seven-segment LED digital display, out-front controls, and more!

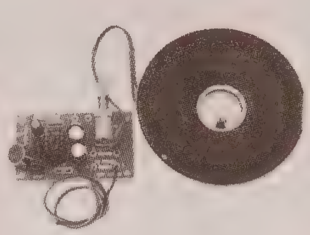
Requires 6 “AA” batteries.



Uses spring hook-up method

ELECTRONIC PROJECT KITS

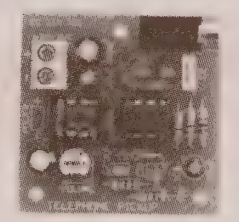
TWO STATION INTERCOM (OR HARD WIRED LISTENER)



Two units employ LM386 IC's in each station. These need to be connected using a pair of wires (about 22 or 20 guage solid). You could power the remote from the base unit if you can run four wires. Each station has its own mike, speaker and amplifier. May be set up to monitor baby's room etc..

80-210 .... $19.95

SUCTION CUP PHONE PICKUP WITH AMPLIFIER



No electrical connection to the telephone is required, attach a suction cup to the hand set and turn on the amplifier. This project permits group listening to phone calls. Or you can monitor any other oscillating electrical field. Dual IC's provide a good quality amplifier, the circuit runs on 6 volt DC. Everything is included except the batteries.

80-550 .... $19.95

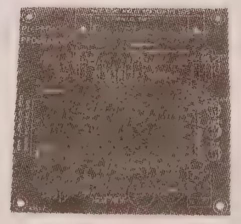
5 LED SEQUENTIAL FLASHER

KIT 52 MOTHERBOARD

The circuit flashes 5 LED's in sequence repeatedly until you turn it off. Flash rate is user adjustable. The circuit uses an IC chip-on-board which you will then mount on the included motherboard, battery holder is included. Powered by a 3 volt supply or battery, good for a child's toy or for those "high-tech" looking special effects for stage plays etc..

80-525 .... $8.95

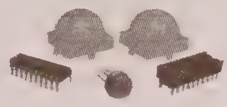
SERIAL PIC PROGRAMMER



This circuit uses the P16PRO software from Bojan Dobaj (you download from internet and register for $25) This circuit will program all 8, 18, 28 and 40 pin serial programmable PIC's. The software will work under DOS or Windows. Use the PIC12C5XX, PIC14000, the PIC16CXX series etc., see list. Make or buy an adapter and you can program 64 pin PIC's. Here are the PIC's that this unit will program: PIC12C5XX, PIC14000, the PIC16C61, 62, 62A, 63, 64, 64A, R64, 65, 65A, 66, 662, 620, 621, 622, 642, 67, 71, 72, 710, 711, 715, 73, 73A, 74, 74A, 76, 77, 84, 923. PICF83, 84. PIC16CC924, PIC16C67X PICCR62, 83, 84.

80-960 .... $28.95

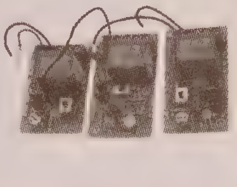
MOVEMENT DETECTOR COMPONENTS



This is not quite a complete kit, the package contains the three key parts for a PIR detector (personal infrared detector). You get the PCB mounted Fresnel lens, a PIR movement sensor and the integrated Circuit that we use in the full kit (No. 80-300). Included are eight pages of documentation notes and circuits to show you how to proceed.

80-620 .... $17.95

THREE LIGHT/DARK ACTIVATED RELAY SWITCHES



This kit is one of our three separate circuits in one, three separate PC boards etc.. This one will give you both useful circuits and experience in different approaches, circuit wise, to doing the same thing, controlling a device with a change of either light or darkness. Each kit is equiped with a relay rated up to 240VAC @ 5 Amps. You may either turn "on" or turn "off" the controlled device. A good kit for the student learning electronics.

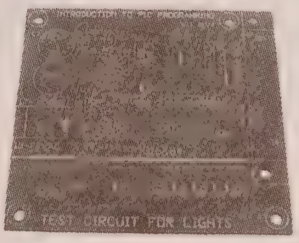
80-790 .... $29.95

ONE CHIP AM RADIO

This is a complete AM radio for the standard broadcast band, most of which is on a single IC. Other components, such as the coils and variable capacitor to make a finished radio are included. The IC is the RF amp, detector and AGC circuitry. The IC's output drives a two stage transistor audio amplifer and 3" speaker. Operates on 9 volt battery. A good kit for beginners to see and build.

80-630 .... $14.95

PIC (programmable IC) PROGRAMMER



An entry level programmer and terrific educational aid. The 16C84 microcontroller from Microchip Technologies has become very popular with hobbists and beginners. Does not require U/V light to erase programs; programs are erased electronically and the chip used repeatedly. This kit includes all the software and hardware needed to begin programming, a full manual is on disk. Connects to an IBM-PC parallel port, connector included. Nine volt transistor battery operation.

80-810 .... $49.95

78XX REGULATED POWER SUPPLY

This circuit can be made into a regulated power supply for voltages from five volts up to twenty-four volts.The user must add any of the standard 78xx TO-220 positive regulators (7805 or 7806 or etc...thru 7824) and the voltage will equal which ever part you select (the last two digits of the number indicates voltage; 7805 = five volts etc.). Input AC or DC (unregulated) about three volts greater then the desired output voltage, complete instructions included. The 7800 series outputs up to one ampere typically. LED indicator and on-board on/off switch. You could use this with a junk box AC or DC power supply or supply your own transformer etc..

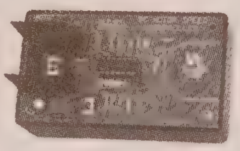
80-600 .... $8.95

PROGRAMMABLE DICE

The idea of an electronic dice game of one kind or another is almost as old as glaciers. But this one is very clever and includes software on a floppy (for the IBM PC) plus a huge manual describing how such things work, software for other projects etc.. This may be the most educational kit in the line.

80-710 .... $29.95

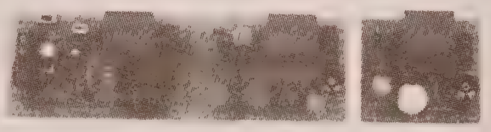
DC MOTOR SPEED CONTROL



Vary the speed of DC motors the very best way with this kit. Gear boxes can be costly and series resistors may cause stalling. This circuit delivers the voltage to the motor with pulses and the speed is controlled via pulse width modulation (PWM). The speed control is a potentiometer, for DC motors up to 100 volts at a maximum of five amps.

80-670 .... $29.95

THREE TIMER CIRCUITS

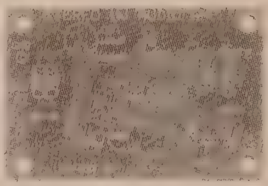


Timer circuits are handy for many experimenter's laboratory fuctions, not to mention photo or PC lab. This kit is another three-in-one in that all three circuits are complete and separate, simply using different types of circuits to do the same job. All come complete with 5 amp relays for controlling pretty significant loads. All may be operated on battery or light weight (9V DC) supply. The advantages of each design are discussed in the text.

80-850 .... $35.95

ELECTRONIC PROJECT KITS

1 WATT STEREO AMPLIFIER



An amplifier designed with portability in mind, ideal for battery applications. A full watt from each channel, excellent fidelity. Uses a Samsung KA2209 IC. Small size: the board is 1-3/8" by 2". All basic parts supplied, including PC board; you supply two 8-ohm speakers. We suggest a six volt or nine volt battery pack using AA cells, use D cells if extra long battery life is required. Amplify your CD or Walkman etc..

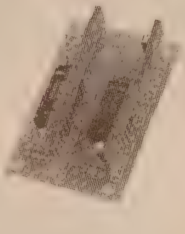
80-870 .... $8.95

10 WATT X 10 WATT STEREO AMPLIFIER

Employs the TDA2009 class AB audio power amplifier IC for quality stereo applications. May be operated on a supply voltage of 8 to 22 volts DC. This is a very straight foward stereo amplifier; complete with a PC board about (1-3/4" X 3"). Powerful enough to power your stereo for a midsized room and more then enough for use in a automobile.

80-088 .... $19.95

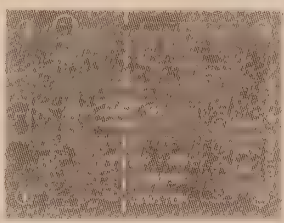
STEREO VU METER



This is a very eye appealing audio accessory. Displays an approximate output level for each channel of stereo amplifier. Connects to the speaker terminals, levels are displayed in ten discrete steps. User may select a moving dot bar appearance. Uses two LM3915 IC's, includes a discussion of measuring audio power.

80-880 .... $22.95

117 VOLT AC RELAY BOARD



Many electronic projects use a low voltage circuit, i.e. timer, light sensor, dark sensor, temperature sensor, movement detector etc.. and output a signal when a certain predetermined event occurs. The signal is often a rising or falling 12 volt pulse, But then what do you do with it? You use it with this circuit to control a relay capable of handling up to ten amps (or five amps @ 240VAC.) The circuit includes a DPDT relay with a life expectancy of about ten million cycles. Be sure to house this circuit in a suitable case, from exposed 110V AC connections.

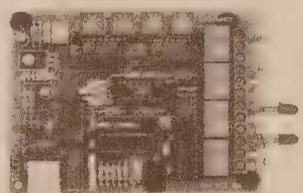
80-840 .... $17.95

PARALLEL PORT RELAY BOARD

For the IBM PC (software included). With each advance in personal computers, a surplus of unwanted older machines increases, either at give away prices or you may have one sitting on a shelf. Thus you can have a low cost, sophisticated "dedicated controller" to turn on or off devices in the home or lab or radio shack etc.. The circuit includes eight relay controlled with (included) software for either DOS or Windows 3.1. Connects to the parallal port of any IBM-PC.

80-740 .... $64.95

TELEPHONE REMOTE CONTROL SWITCHER.



You may call your own phone and switch up to four relays on or off; a four digit code (of your choice) protects unauthorized use. The brain of the circuit is a motorola 68HC705K1, the fully commented source code is provided on a floppy disk. (No programming is required, disk is provided for educational purposes or a very sophisticated user.)

FEATURES: Four relays, independantly switchable (or all "off"). Low power consumpition: 10mA when idle, 15mA running when no relays are pulled in. Power with 9 to 12 volts DC battery pak or an AC adapter.

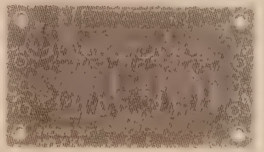
80-860 .... $74.95

OSCILLATOR BUILDING BLOCKS

Build and experiment with a stable, monostable and RS flip-flop multivibrators on one PC board with six LED's. See and understand exactly how each works. This is a very educational kit and an excellent introduction to electronics. Operates on 9V battery.

80-090 .... $7.95

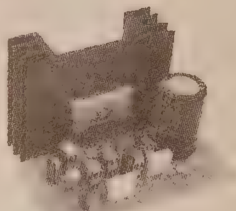
3 WATT STEREO AMPLIFIER



The Rohm BA5406 is used to make this powerful little stereo amplifier. The entire circuit is on a 1-1/2" X 2 1/2" CIRCUIT BOARD. You'll need to allow added space of 1-1/2" x 1-1/2" x 2-1/2" for the heat sink, plus ventilation for same. In addition to a 12 VDC power supply (batteries), you will need to provide 4 or 8 ohm speakers, cables and a heat sink compound to put between the IC and the heat sink.

80-900 .... $14.95

17-1/2 WATT MONO AMPLIFIER



A high quality audio amp that can operate on a low voltage, 12 V DC recommended. Uses the Hitachi HA 13001 IC and a dozen external components for a compact and powerful monaural amplifer. Builder must supply his choice of speaker (4 or 8 ohm) and some heat sink grease to apply between the IC and the heat sink. Includes PC board and all parts. Build two for stereo.

80-1105 .... $13.95

FOR FUN, C.O.B. PROJECT KITS

C.O.B. means **"Chip on Board"** and most of the electronics are inside a tiny, *application-specific* chip or integrated circuit on a PC board. These circuits are fun but won't be much of a challenge or educational they are so simple, you add a battery and the circuit is ready to go.

FOUR TRAIN SOUND EFFECTS

Ideal for most railroads, produces the whistle, train chugging sound, crossing bell and the clickety-clack of crossing a bridge.

80-910 .... $7.95

CELLULAR PHONE SOUND EFFECT

Good for a kids toy, imitates the cellular phone sound perfectly.

80-920 .... $7.95

ASSORTED MELODIES

Great for kids! Sixteen melodies such as: "Farmer in the Dell", "Hush Baby", "Home on the Range" and other family tunes.

80-930 .... $7.95

AMBULANCE, FIRE AND POLICE SOUNDS

Sirens and machine guns and more, great for kids toy!

80-940 .... $6.95

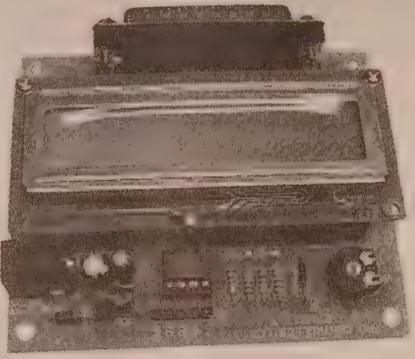
HAPPY BIRTHDAY ON A CHIP

A great item to hide in a package, plays happy birthday repeatdly.

80-950 .... $5.95

ELECTRONIC PROJECT KITS

PERSONAL COMPUTER CONTROLLED LCD & THERMOSTAT



The LCD screen is just a bonus; you may program it to say anything, fed from personal computer. A more interesting use for this kit is the thermostat function. The board may be programmed and then disconnected from PC to function as a stand-alone thermostat. Set a high and low temperature and outputs may be used to switch external devices, such as relays controlling heaters or coolers, open windows, etc. Readouts may be in Fahrenheit or Celsius. Software is included and detailed instructions for use.

The kit uses the DS1620 chip from Dallas Semiconductor. The chip measures -55° - 125° C (-67° - 257° F). You will meed a small AC/DC Adapter to provide 12V DC @ 50mA.

80-134 .... **$44.95**

TOUCH SWITCH WITH RELAY KIT

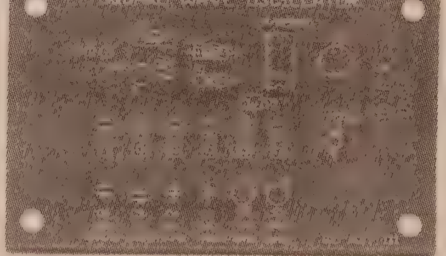
The touch switch may be used to turn on almost anything with a light touch of 'plate'. The circuit pulls in a relay which remains engaged for anything from five seconds to about a full minute, depending upon you changing just one resistor to set the time amount (default is five seconds). One of the unique features of this circuit is that the touch-plate may be located up to several yards away from the circuit board if necessary. It may also be battery powered if an AC supply is not convenient. An LM555 is used in the heart of the circuit. The relay can handle up to 12A in its contacts. A 12V battery pack or AC power supply is recommended although we've used the circuit on an unregulated 9V supply.

80-137 .... **$9.95**

SQUARE WAVE OSCILLATOR KIT

This is a very simple circuit, generating square waves for use with test equipment, teaching, etc. Generates square waves of approximately 1Hz, 100Hz, 1KHz, 10KHz, & 100KHz.

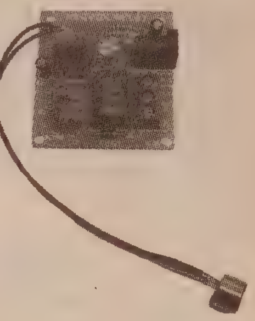
This is a good teaching aid kit, both for the instructor and the DIY user.



PC Board only pictured, But ALL parts included.

80-111 .... **$15.95**

MINI-VOX & RELAY KIT
(SOUND ACTIVATED SWITCH)

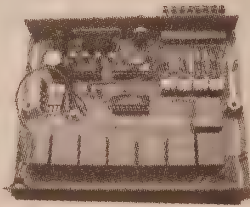


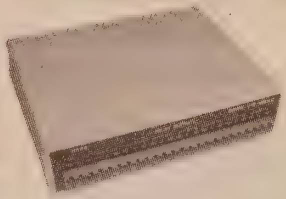
For the uninitiated, VOX = Voice Activated Switch. This is a switch (relay) that may be activated with any sound, including the human voice. A very sensitive circuit that may be adjusted to react to very low volume sounds or a yell or hand clap. While a VOX is often used to activate a sound recorder, it may be used to trigger an alarm (the mike easily picks up vibrations in windows, walls or door), activate a video camera, radio transmitter or simply turn on a light. The relay may release after a few seconds of silence, holding as long as sound continues. (hold time may be changed up to 30 seconds)

Operates on 12V DC very low current.

80-126 .... **$13.95**

SERIAL ISOLATED I/O MODULE
(SERIAL PORT RELAY BOARD)

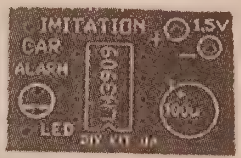




Added in response to the popularity of our part no. 80-740, which is for use at the parallel port. This programmable set of eight relays that connects the serial port to a PC. This permits location at some distance from the PC (about 100 yds), plus the circuit may be disconnected from the PC once it has been programmed. Latched relay operation, 250V / 12A certified relays switched (250V rated) and with 4 external inputs. Programmable. Comes with case and end panel pieces as shown in photo. Uses serial port so it can be located over 100 yds from the PC.

80-108 .... **$89.95**

CONTINUITY TESTER/ LONG LIFE FLASHER (LM 3909)



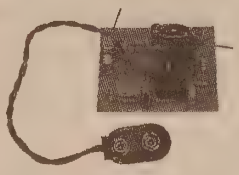
CONTINUITY TESTER
LM3909
PROBES

Most IC's operate on 4V to 40V range. But using IC type LM3909, a 1.5V D cell will flash a LED for over two years. Use as an imitation car alarm. A second PCB uses the same IC as a 1.5V continuity tester with buzzer. Two PCB's, two complete circuits except only one IC (swap between, sockets included). Includes documentation from National Semiconductor. (For a more sophisticated continuity tester, see No. 80-110 pg. 32). Bare boards shown to right: kits include all parts but you'll have to swap the single IC to use both at the same time you need to buy one more LM3909.

80-011 .... **$11.95**

ELECTRONIC PROJECT KITS

RIAA EQUALIZED PREAMPLIFIER STEREO KIT



The groves in phonograph records could not handle the deep bass and high treble in live music. The industry developed a standard recording curve and the missing sounds were compensated for by circuitry in playback preamplifiers. The R.I.A.A. (Recording Industry Association of America) set the standard for the "RIAA curve".

Today amplifiers are designed for flat response and they make old phonograph recordings sound very flat. Using an RIAA preamplifier compensates for todays flat amplifiers exatly as the old phonographs were able to do. The kit duplicates the RIAA curve accurately; at a kit price. Operation on 9 to 12 V. DC.

80-007 .... $11.95

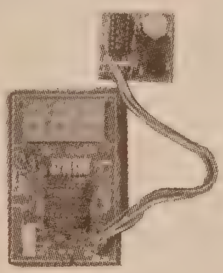
STAIRWAY TO HEAVEN GAME

Pressing the switch while a dual LED is green advances you to the next stage; but mess-up and press while red, and you go back to the beginning. It can be tricky and a challenge. Fun and teaches basic electronics.

Operates on 9V battery.

80-005 .... $15.95

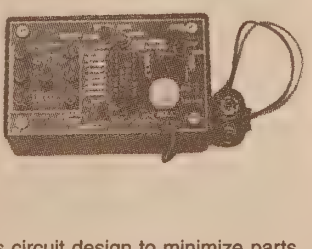
THREE DIGIT COUNTER MODULE



An event counter; this economical counter module may be ganged for six or nine digits. Has count and reset switches with debounce built-in. Operates on a nine volt battery. This is a two board kit with the count and reset switches along with the debounce circuitry on one board, the LED digits and circuit on another.

80-010 .... $21.95

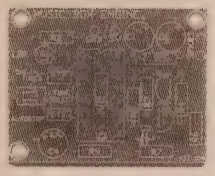
LED DICE WITH SLOW-DOWN



This is an excellent kit for use as an introduction to electronics and circuit analysis. Seven LED's arranged like a real die face. Push the switch and the dice rolls and then slows down and then stops. Uses an ingenious circuit design to minimize parts count. Uses a 555 and 14017 integrated circuits. Includes plastic case; battery operation.

80-030 .... $12.95

MUSIC BOX ENGINE, LIGHT ACTIVATED

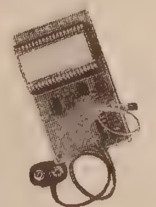


This circuit will play a tune when light strikes a light dependant resistor, such as when a music box is opened. You can select any one of about a dozen romantic melodies; play just one or let the unit cycle through all of the tunes. Operates on 3V DC, two AA cell holder included. You could really wow a girl friend or simply please your mom.

80-014 .... $12.95

LCD TEMPERATURE METER

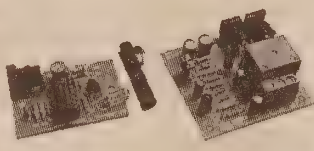
(Celsius Only)



Designed around a single IC, the Harris No. 7106, is this temperature meter with excellent accuracy. All parts needed, even a case, are included except nine volt transistor battery. Instructions also explain how to use the kit to make a volt or an amp meter in various ranges. The circuit board has room for additional components if you use it to make a digital panel meter.

80-020 .... $32.95

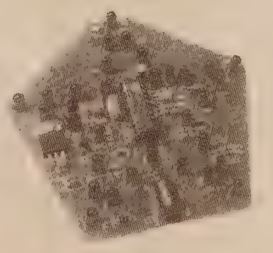
INFRARED BEAM DOOR MINDER



A transmitter sends an I/R beam up to 75 feet to a reciever (on separate pc board); breaks the beam and a relay is tripped. Use the relay to control a bell or light or other device; even a video recorder and camera. Operation requires 9 to 12VDC, a wall adaptor is fine and you may want two units (provision is made to power both boards with one supply via a two conductor wire). Use to watch hallway or drive way, across the doors to a three or four car garage etc. and we know of a photographer taking wildlife photos this way. The uses for alarms, photography, door minding and so on are numerous. You could make weatherproof hoods to use out-of-doors but be sure to protect from moisture.

80-013 .... $22.95

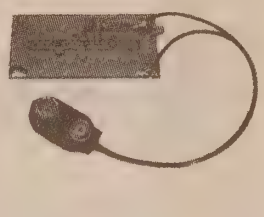
FLASHING STAR PROGRAMMABLE



Uses the Atmel AT89C2051 micro-controller, which comes already programmed with a clever and complex display pattern. The 30 LED's follow each other about and finally hold a star pattern for a moment. Or, you can download software (free) to set up your own pattern. Place in a window or on top of a Xmas tree; the super bright LED's produce a very spirited holiday feeling. This is an excellent micro-controller learning kit with full explanation of how the device works and drives the 30 LED's. Operate with wall adaptor at 9 volts and about 150 milliamps (maximum). A very nice kit.

80-046 .... $37.95

R.F. AMPLIFER KIT

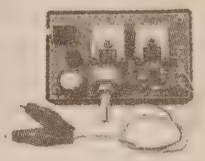


A small circuit, using the Mar-6 Amplifier IC, this kit will provide as much as 20 db gain. Connect at receiving antenna input; will boost signals from 1 mhz to 1000mHz; two RF amplifier kits may be cascaded for use at low, broadcast-band frequencies. Use with Scanners, Ham recievers, SWL reciever etc. You could add a metal case and RF connectors for permanent use. May be used to boost signal for scope or frequency counter as well.

80-045 .... $17.95

INTRODUCTION TO A POWER SUPPLY

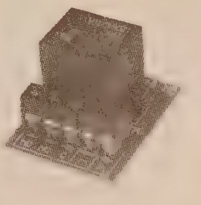
(Practical hobbyist power supply)



A practical battery eliminator for circuit projects at the bench. This is a basic power supply using two IC's (7805) regulators. User needs to supply a transformer up to 20V AC for input (see page 114). Outputs are regulated, one variable and one constant 5V DC. A good introduction to power supplies.

80-040 .... $14.95

PC BOARD MOUNTED RELAY



The output of many circuits have an alarm signal which must be connected to a remote switching device. Or, sometimes you will have a kit to test which needs a relay connected to it. For this purpose, this kit is perfect. A 12 volt (coil) relay mounts on a PC board which includes a protective diode and terminal blocks. The terminal blocks make for fast, easy screw-connection of wires to coil and to the contacts.

If you prefer a different relay coil voltage, the boards are available separately. Board accommodates any Philmore relay from 3V to 24V coils (all ten amp contacts). See index for relay page.

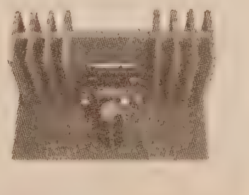
Relay kit with 12V, 10 amp relay, PC board and hardware.

80-043 .... $7.95

Blank boards, Package of two.

12-605 .... $3.95

44 WATT STEREO POWER AMPLIFIER



The circuit is a gem; a TDA1554 IC is the heart of an amplifier that will output 22 watts per channel with excellent sound quality. (Typical THD less then 0.1%!).

Originally intended for automobile use, but can be used as a home amplifer if you have a good power supply. Operates on 13 to 14.4 volts (typical automobile voltages with engine on) and can draw as much as five amps at 13.8V DC.

80-050 .... $29.95

ELECTRONIC PROJECT KITS

PLL EXPERIMENTER KIT FROM KHZ TO 185MHZ

An exciting circuit, the PLL Experimenter kit may be used for making a stable AM or FM trasmitter, a Signal Generator (from low kHz to about 185mHz), a QRP Ham transmitter, circuit diagrams for all these included. What you get is a very high quality PLL circuit module, with touch-tone style keyboard (to set frequency) and you will have to add the components for the circuits mentioned above. Crystals can be expensive; this is the answer. Not a beginners kit; intended for the serious experimenter, Hams or very advanced beginner. Operation from 8 to 12V DC; a nine volt battery is ideal. Fine tuning in 10 kHz steps. Extra room on board for added components. This circuit is really worth having!

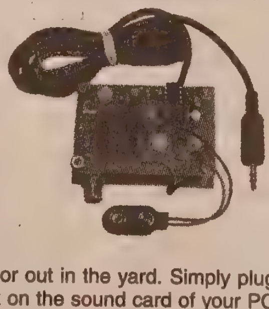
80-035 .... $39.95

PLL TUNED FM-STEREO TRANSMITTER

Try this with your computer to re-transmit internet radio! This is truly a slick product! The PLL (phase locked loop) tuning means stable broadcasting, which results in big advantges.Being on frequency and drift-free equals much better transmit distance and receive quality. Frequency is "entered-in" on a keyboard, the unit stays exactly on frequency. Transmit to your portable radio! For input use your CD player or tape player or your computer so that you can broadcast programming on the internet to your portable radio; listen anywhere around the home. Operates on 9 to 12 Volts DC.

80-055 .... $79.95

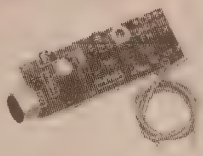
INTERNET BROADCASTER Quality FM Stereo Transmitter



We designed a kit specifically for use with your personal computer, to rebroadcast in the FM band (stereo) the programs that you might listen to on the internet. This is so that you can listen to those programs from anywhere in the house or out in the yard. Simply plug the unit into the jack on the sound card of your PC and tune in any FM radio. Sound quality is VERY GOOD and the cost is much less than then our top-of-the-line No. 80-055 (which out performs them all)You can listen to CD's too, of course, and now you don't have to miss your favorite shows if you have your Walkman in your pocket and will be around the house or office. Plenty of power for most homes and around the yard. Use with 9 to 12 volt battery pack or AC adapter.

80-085 .... $30.95

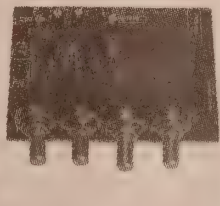
3 VOLT FM TRANSMITTER



The most powerful circuit we've seen that operates on such low voltage (just two AA cells). A range of 100 meter scan be expected and given a good antenna and good conditions, 500 meters is not unusual. Can be operated on up to about 9 volts. Transmits to the FM radio band. Teaches basics of transmitters. Microphone is included.

80-070 .... $7.95

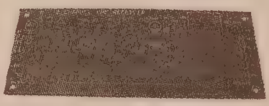
THE TONE-VOLUME-BALANCE CONTROL KIT



A serious audio (stereo) circuit; used much like a preamp (eliminates the need for one); that is, between the audio source and your stereo amplifier. Use with your amp or with our kit No. 80-088 ten watt stereo amplifier or with the No. 80-050 44-watt stereo amp (etc.). The kit has separate Bass, Treble, Balance and Volume controls; with loudness contour switch as well. Designed to run on 12 volts DC (@35mA), the circuit will work on "clean" DC voltage from 7.5 to 16 volts ("clean" means low ripple or using battery power). You will need to furnish the power supply and phono connectors and/or cables.

80-075 .... $32.95

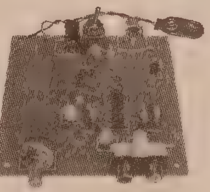
UHF REMOTE CONTROLLED RELAY KITS



Two seperate relays can be switched via encoded signals transmitted from a key-chain size, two-button transmitter (like those used in some car alarms). Push a button and relay toggles "closed" and one more push toggles it "open". Transmit distance is about 120 feet maximum. The reciever requires from 12 to 15 volts DC. The transmitter is supplied assembled and teated; just plug them in and solder in place. Each relay can handle up to 10 amps @ 120 V AC; Plenty for numerous applications; control lights, door locks, magic show etc.

80-082 .... $46.95

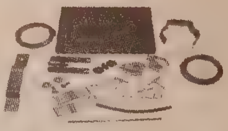
FM STEREO TRANSMITTER



This is a circuit that will broadcast CD quality to your FM Walkman, home stereo or automobile radio. It produces a strong signal that will generally cover the average home and yard. It is stable enough to use even with a digitally tuned fm receiver. Typical uses inlude broadcasting your own music to a receiver at poolside or in the garden. Or you can broadcast from a personal, portable CD player to a car radio that has no CD player. School uses include running a "broadcast station" from another room as a speech class exercise. The unit is powered by a 9V transistor battery or an AC adaptor.

80-060 .... $39.95

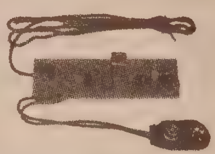
DC ELECTRIC MOTOR KIT



An introduction to the workings of an electric motor. A few pieces of metal, some wire and then add your own 1.5 volt AA battery and the whole concept of what makes an electric motor run will be yours. A number of experiments are included in the instructions, which the teacher could use to get young minds wrapped up in this project. Snaps together, no soldering required. (Kit shown in knocked-down form.)

80-077 .... $15.95

VARACTOR TUNED FM TRANSMITTER WIRELESS MIKE KIT



This is the Cadillac of FM transmitters, and wireless mikes. Transmit the standard FM radio band; tune to open frequency. Varactor tuning results in stable signal, free from stray capacitance and drifting. Sensitive, picks up conversations from several feet. Powerful operation on a nine volt battery but could use 12V DC if you are going for distance. Easy to build, good for teaching beginners with just a bit of supervision.

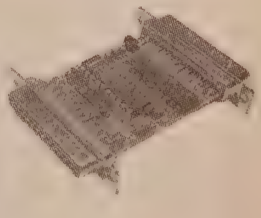
80-065 .... $14.95

CONTINUITY TESTER

This most often needed piece of test equipment checks continuity at two switchable settings: 2.8 or 185 ohms. The unit will buzz when a continuity below the set resistance is encountered. Based around the LM324 op-amp IC. This kit is wonderful for beginners that need to learn to solder, identify components and finally end up with basic teat equipment circuit that will be useful as they continue their education. (shown the PC board only; the kit includes all parts except 9 volt battery).

80-110 .... $8.95

12 BIT DATA ACQUISITION SYSTEM

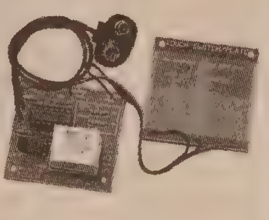


The circuit, once built, connects to the parallel port of a PC for data input/output. Uses the Maxim 186 IC; collect analog and digital information and store them on the hard drive. Included software can display and interpret the data, provide trends etc.. This is a very sophisticated little device and software (good Science Fair stuff too). Manuals and software are zipped on included diskette. This is for somewhat sophisticated users that know their way around a PC fairly well. Not for beginners. Power with 9 or 12V DC.

80-118 .... $79.95

ELECTRONIC PROJECT KITS

TOUCH OR CONTACT SWITCH



Both a touch and a contact switch are built into one PC board so that the builder can see how each works. A battery can power the contact switch but you'll need an AC power supply for the touch switch to work well (use No. 80-040) for reasons explained in the kit. The circuit swiches a relay with a three amp, 110 volt rating. Use to switch lamps, other appliances.

80-100 .... $10.95

LIGHT ALARM

A sensitive photo Darlington transistor is used with CMOS nand gate. The circuit detects light and trigers a siren. You could add your own triac or relay and switch practically anything. The kit uses the MEL12 Darlington superalpha phototransistors, typically about ten times more sensitive than a normal phototransistor. The circuit usage includes burglar alarms, medicine cabinet alarm, automobile alarm etc...

80-080 .... $8.95

STEREO PREAMPLIFIER KIT

Amplify any tiny audio signals about fifty times, and deliver them to a power amplifier cleanly and undistorted. An AGC (automatic gain control) eliminates pops and distortion. This circuit will be useful in boosting the output from the tape heads, microphone or a magnetic phono cartridge etc.. For input of an audio amplifier. Requires a 12V DC power supply at about 100 mA peak.

80-104 .... $11.95

UNIVERSAL TIMER

Set timer for anywhere from a few seconds to about 15 minutes, control AC appliances; it will beep and trigger a relay when it has timed down. May be used for a darkroom or PC board exposure timer etc.. Turn anything on or off. Operates from 9 volt transistor battery.

80-102 .... $12.95

HOME CAR ALARM

This circuit is an alarm for the home or car door, and a lot more. It employs a magnet and reed switch to trigger the circuit. An integral piezo sounder produces the alarm sound (100dB). But, a relay capable of handling up to 10 amps AC may be connected to turn on or off appliance, external alarm sounder etc. Therefore the circuit could be used to turn on a light whenever a basement or garage door is opened.

80-101 .... $12.95

PHOTO SENSOR WITH CONTROL RELAY

The most popular usege for this kit is to make your own nitelight. But you could switch just about any appliance either on or off with either darkness or daylight. Light sensitivity is adjustable over quite a range. The relay can handle up to 10 amps AC. You need to add a nine volt transistor battery or a nine volt, 25 mA supply.

80-103 .... $9.95

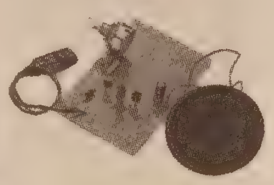
UNIPOLAR STEPPER MOTOR DRIVER KIT

STEPPER MOTOR DRIVER

A stepper may be used to orient a video camera, antenna, spotlight etc.. or used for table position in production. This driver will control a 5, 6 or 8 lead unipolar stepper motor (often available from surplus dealers). The circuit permits fast or slow run rate and even single stepping into final position; uses the UNC5804B IC. Four LED's indicate movement if the motor is remotely controlled (input from 6 to 35 volts). The kit is supplied with quite a bit of good information, how to identify motor connections, spec sheets and a list of references for reading about steppers etc..

80-109 .... $24.95

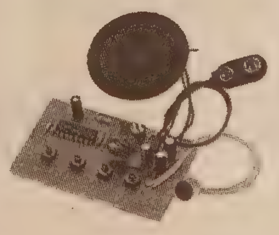
SOUND EFFECTS GENERATOR



Another novel circuit that might be useful for special theatrical effects. Or if you are simply a practial joker. The circuit can produce sounds such as a tick-tock of a grandfather clock, a heart monitor (as in the hospital), water on a tin roof, a motor boat, cricket, etc.. Requires a 9 volt battery. Includes its own speaker.

80-106 .... $8.95

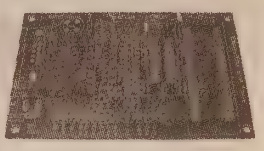
VOICE CHANGER



Your voice can be changed to add a vibrato, like those used to disguise secret witnesses. Or, you may change your voice tone upward or downward; women sound like men and vise versa. Includes a very ROBOTIC voice as well. A microphone and speaker are included on the PC board, all that you need to add is a nine volt transistor battery. This is a very novel and entertaining circuit.

80-105 .... $15.95

ATMEL AVR PIC PROGRAMMER KIT



The kit is a powerful programmer for the ATMEL. AVR series 20 pin and 40 pin EEPROM's, most with SRAM. The series includes AT90-S1200 & S2313 twenty pin and AT90S4414 & S8515 forty pin devices. These low power CMOS devices feature flash memory, non-volitale EEPROM as well as fuses and lock bits and RISC architecture. Electrically erasable, they may be programed over and over again. (Data sheets available at www.Atmel.com)

This programmer has a serial port for connection to a PC. No special software needed, any terminal emulator program that can send an a ASCII text file will work (or download FREE term.exe, info included). The PCB will accomodate ZIP programming sockets (not incl.) if you wish to add them. Power with a non regulated 12VDC AC wall adapter @ about 150mA (which should run about16VDC with no load).

80-122 .... $47.95

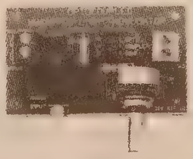
ATMEL MICROCONTROLLER PROGRAMMER

This kit is a complete and powerful programmer for the ATMEL 8051 family of microcontrollers. This series of ATMEL devices uses flash memory to store programs; which means they are electronically erased/programmed with out need for U/V eraser. The 89(L)S8352 chips even have EEPROMS which can also be programmed with this kit. The programmer supports the following ATMEL devices 89C1051, 89C3051, 89C51, 89LV52, 89C55, 89LV55, 89S8252, 89LS8252, 89C4051, and 89S53,8953.

Programmer automatically reads a chip's signature bytes so that you may just plug in any of the series and go! Device instructions and all ATMEL device fuse and lockbites are also programable with this program. USE: Connects to the RS232 serial port of any PC. Connect using any terminal emulator program capable of ASCII text file transfer, such as windows terminal, Windows 95/98 Hyperterminal or DOS Texix, ProComm etc.. A simple DOS terminal program which we use TERM.EXE is a free download. Power: 16VDC use an unregulated 12V 150mA wall adapter which will put out about 16VDC when no load. (Data sheets for all this series of ATMEL devices may be found at www.Atmel.com)

80-123 .... $64.95

AUDIO TO LIGHT MODULATOR

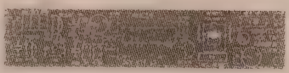


Introduces the optocoupler-triac MOC3010 and power triac. Complete electrical isolation between input and audio signal (low voltage circuit) and output light modulation is achieved. Drive the circuit with a 1.2 to 1.5 volt music signal. Operates from 110 volt AC line. Audio input via 3.5mm jack.

80-120 .... $9.95

ELECTRONIC PROJECT KITS

SOUND ACTIVATED SWITCH FOR TAPE RECORDER (VOX SWITCH)



Turn on any tape recorder that has remote on/off jack (most cassettes). The circuit has feed back and delay circuit for robust operation. You could add a relay for switching heavy loads; and tape recorders are not the limit. How about turning on lights via voice or a whistle? Circuit switches off after 6 seconds of silence.

80-130 .... **$10.95**

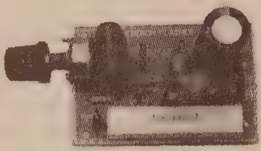
SOLID STATE VOICE RECORDER

Record messages between twenty and thirty seconds in length. The recorder memory is non-volitle, so the message is retained even if the power is "off". This unit has much better quality audio than any that we've heard; the sound is very close to natural. Operation on DC between 5 and 7 volts. The control (record & playback) switches may be mounted off the board, so it can play a message when opening a door etc....e.g. "stay out of my tool cabinet!!" In addition to the voice IC, the circuit includes an LM386 amplifer to play into an 8 or 16 ohm speaker.

Use this circuit on the 'frig to leave messages or in the car for helping to record a thought.

80-131 .... **$21.95**

110 VOLT AC STROBE LIGHT KIT



Usually more practical then a battery operated strobe, runs on standard house current. The flash rate is adjustable from about one every three seconds to about three per second, Uses are as signal beacon, trade show kiosks, discos, etc.. Very bright flash can be seen for miles at night, Like thoes in airplanes. AC cord and plug not included.

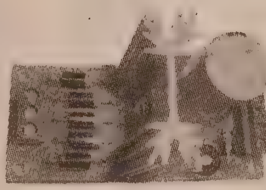
80-140 .... **$29.95**

LOGIC PROBE

An indispensible piece of equipment for testing and measuring digital equipment. Normally used for fault finding and testing but can also be a great help in design work or to see how digital equipment works. Switch for use in both TTL and CMOS. Detects very fast pulses. Output is 3 LED's and audio indicator.

80-240 .... **$12.95**

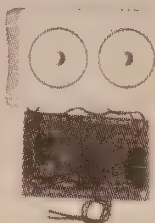
POSITIVE ADJUSTABLE POWER SUPPLY MODULE KIT
NEGATIVE ADJUSTABLE POWER SUPPLY MODULE KIT



These two kits can be used separately or assembled together to create a dual rail power supply. Current up to 1.5 ampere output. Both kits feature reverse polarity protection, LED power ON indicator, IC regulator, variable output voltage, low noise, Ac or DC input and up to 37 volts output. Complete details for selecting a transformer (transformer is not included, you must supply input voltage of 3 volts more than desired output) are included. A through description os assembly options is included with each kit.

80-124 Positive Kit **$14.95**
80-125 Negative Kit **$16.95**

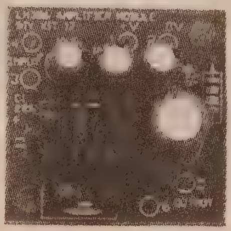
6-12 VOLT ALARM MODULE WITH SCREAMER



The loadest piezo alarm that you will find, 108 to 110dB output at one meter. The kit includes a resonant cavity mounting case which is molded plastic, 2" x 3-1/4" and 1-1/4" deep, plus mounting ears. If you want to totally startle a burglar, this is the kit to assemble. Operates on 6 to 12 volts. You'll need a good supply, it draws about 500 mA maximum.

80-150 .... **$16.95**

AUDIO AMPLIFIER MODULE



A good, variable gain amp to use with other projects, amplify radio circuits etc.. Use the National Semiconductor LM386 Intergrated Circuit, a well known and quality IC. Kit includes the data sheets from NS. Battery powered, may be operated from 4 to 12 volts DC. Powers a small speaker for personal listening.

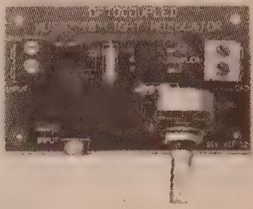
80-170 .... **$6.95**

FM TELEPHONE TRANSMITTER

Miniature transmitter attaches to the phone line and transmits the conversation. Transmits 200 yards and more in most installations. Tunable to clear spot on the FM band of your radio. Completely parasitic; i.e. uses the power from a telephone line and needs no battery. The circuit might be used to share or record conversation, but please do not use illegally.

80-160 .... **$7.95**

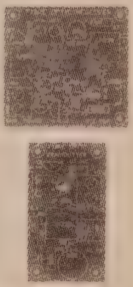
XENON TUBE FLASHER (9 VOLT)



Bright, variable flash rate strobe light can serve as a beacon, signal etc.. A small circuit, easily transported for camping. Uses could includes photography, spooky fun house etc.. (Try turning it on with the VOX switch No. 80-130). Flash rate may be varied to between 1 and four flashes per second.

80-220 .... **$17.95**

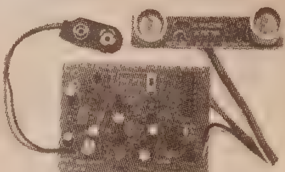
FIBER OPTIC AU



Uses a matched transmitter/reciever pair from either Motorola or Industrial Fiber Optics Co. Allows you to send sound through plastic 1mm fiber optic cable. Two circuit boards with a microphone at one end and a speaker at the other (14' fiber optic cable included).The maximum range is about 220 yards. This can be a Science Fair winner.

80-260 .... **$34.95**

ULTRASONIC MOVEMENT DETECTOR



The circuit uses a matched pair of 40Khz transducer elements to detect movement out to about 22 feet. You may add a relay (not included) to switch a heavy appliance etc, the unit switches just an LED as supplied. The circuit can be switched to latch "on". An ideal alarm circuit that can't be easily fooled.

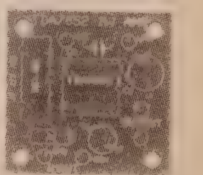
80-200 .... **$29.95**

OpAMP FUNCTION GENERATOR

A very low cost and simple circuit to generate square, pseudosinewave and triangular waveforms in the audio frequency range. Uses a quad OpAMP type LM384. This is an educational kit and recommended to understand electronics more thoroughly.

80-230 .... **$7.95**

ONE WATT AUDIO AMPLIFIER (MONAURAL)



While one watt is plenty for personal use (most small radios that have speakers produce less then 1/4 watt) the size is quite small and easy to fit it into a case with other projects. Battery operated from 3 to 15 volts, six volts is optimum. Output into an eight ohm speaker. The PC board is just 1-13/16" square, tallest component about 5/8" tall.

80-270 .... **$7.95**

ELECTRONIC PROJECT KITS

SOUND ACTIVATED FM TRANSMITTER

Sound turns on the transmiter, which operates in the FM radio band. A neat way to catch a thief in another room or garage. The volume of sound needed to trigger the circuit is adjustable. The two stage transmitter has good range and the circuit powers down unless it "hears" sounds, reactivates with a sound.

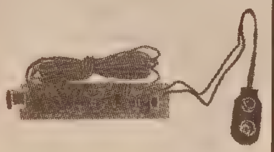
80-280 .... $10.95

ELECTRONIC COMBINATION LOCK

This really is an excellent introduction into electronic security systems. Set your own four digit code, a wrong sequence simply resets the lock. The correct code will activate a relay that can handle up to 240 volts AC. The nine digit key-pad is on a separate board conected to the circuit via a ribbon cable (30"), so a variety of mounting ideas are possible. Requires a 9 or 12 volt battery or supply.

80-290 .... $14.95

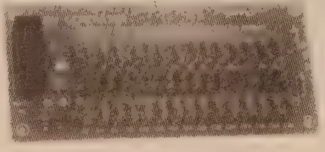
TWO STAGE FM TRANSMITTER, OR WIRELESS MICROPHONE



A powerful little circuit with surprisingly good audio quality. Can transmit up to about 1/2 mile in open country. This is probably the most powerful FM transmitter that you can legally purchase. An electret microphone is used to add sensitvity. the circuit can run on six volts, greatest output is 12 volts, but uses 9 volts and short antenna wire to stay legal.

80-320 .... $8.95

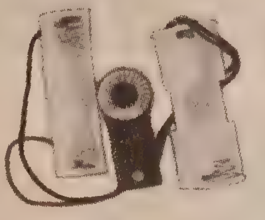
ION GENERATOR



Are there some healthful positive benifits caused by being in an environment that contains negative or positive ions? Some reports suggest a wide range of benefits. This generator can be set up to generate either negative or positive ions, the builders choice. Operation from 117 Volts AC power line. You will need to find a case or box for the final assembly, about 2" x 4-1/4" and an inch in depth and an AC power cord from an old lamp (or buy new). You can actually feel the flow of ions from the unit.

80-570 .... $19.95

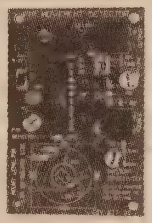
DC TO DC CONVERTER



This unique circuit permits you to use one or two 1.5 volt batteries in place of a 9 volt battery, especially a cost saver when AA batteries are on sale. The circuit uses the TI TL496 IC and can handle circuits up to 100mA, plenty for many small circuits. The circuit is clearly explained in the documentation and is an easy to understand intro to switching power supplies. Input selectable @ 1.5 or 3 volts.

80-350 .... $8.95

PIR MOVEMENT DETECTOR



One of our favorite circuits. The circuit sees infrared heat, such as from intruders body. The kit uses a late development in movement IC's and employs a very sophisticated circuit. You may set it to non-trigger in daylight hours. When tripped, an LED indicator lights and relay is tripped. "Sees" up to about eighteen feet. Operation on 9 to 12 volt battery with very long life.

80-300 .... $34.95

5 LED MULTI-SEQUENTIAL FLASHER

KIT 37 MOTHERBOARD

Flashes five, very bright LED's in any one of seven user-selectable patterns. A COB (chip-on-board) IC makes assembly very easy, the chip is supplied premounted on its own board and a motherboard contains the entire circuit. Operates on 3 volts DC, battery holder included. Continously repeats a sequence when power is supplied.

80-375 .... $9.95

INFRARED TOGGLE SWITCH

Control about any device using the remote control from just about any TV set. The circuit switches an on-board SPDT relay, turn it on with the remote and turn it off with another signal. The relay contacts are rated one amp at 125 volts AC. The circuit operates on any DC supply from 8 to 15 volts, use an old calculator supply etc.. This circuit can have some very practical applications such as turning on a light by an invalid. Your imagination is the limit.

80-580 .... $19.95

(LOUD) 9 VOLT SIREN

A simple circuit with alot of output. Uses a voltage controlled oscillator and includes a half watt speaker. Connect it to an alarm system, sound switch or whatever you dream up. 9 volt battery operation.

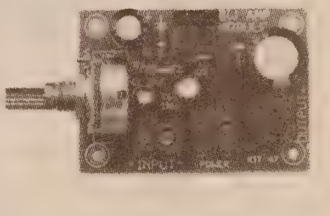
80-310 .... $6.95

GENERAL PURPOSE, 3-1/2 DIGIT LCD PANEL METER

A versatile meter which may be set up for any one of many ranges, for voltage or current. The decimal point is selectable too (i.e. you may put it where you want it). Space is provided on the circuit board for scaling and shunt resistors. Runs on nine volts, very low current drain. Easy to read.

80-340 .... $31.95

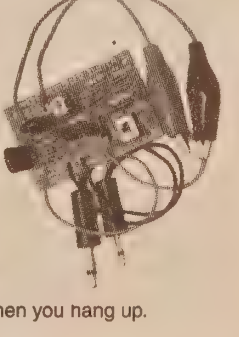
8 WATT AUDIO AMPLIFIER



Low voltage operation does not mean low-power. This amplifier can produce a full eight watts into a standard four or eight ohm "load", such as a speaker. Actually, it can deliver up to 11 watts if you use a 16 volt supply. You may use this amplifier with a wide range of power supplies, from 5 volts to 20 volts. The IC has a built-in current limiting and over-heating proteation. An ideal building block for use with many projects. The audio quality is excellent.

80-470 .... $19.95

LOW VOLTAGE PHONE RECORDER SWITCH

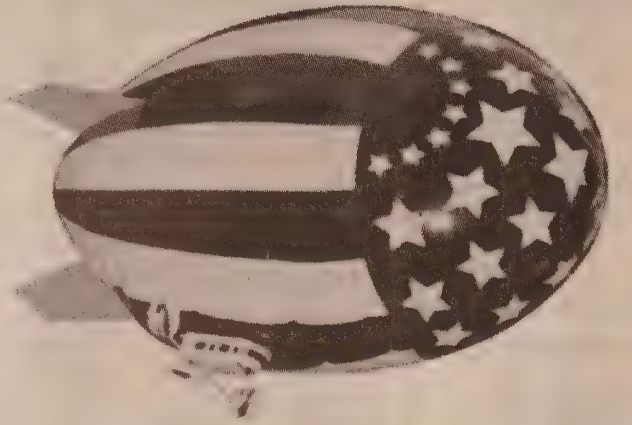


The term "low voltage" applies to the tape recorder itself., many tiny recorders operate on very low voltage (as low as 1.5 V) and older circuit won't work with them. This unit will turn "on" any recorder that has a REMOTE and MIC jack for external control. Turns the recorder on when headset is off the hook, off when you hang up.

80-330 .... $8.95

RADIO CONTROLLED AIR SHIP KIT

Model AS-3..............................$59.95



- Radio Controlled.
- Star Flag Blimp Pattern.
- Three-channel Fuction:
  1. Forward
  2. Backward
  3. Up & Down - 360° Spins
- Spring-type Antenna on Transmitter.
- Helium Not Included. Filled Size: 38" x 21" x 17"
  Requires 2 "AA" Batteries (Not Included)
  For Indoor Use only

Can be filled at most Hallmark Stores, Flower Shops, or any other place that carry Helium filled ballons.

RADIO CONTROLLED RACE CAR

Model RCC-7K..............................$29.95

The purpose of this project is to expand your understanding of basic transmitters, receivers and electronic switching theories. Your Turbo King Car will be built from the ground up. You'll learn all about gears, motors, printed circuit boards, and integrated circuits from our detailed assembly and training manual. You will construct each selection, explore the circuitry and troubleshoot it.

Features
- 7 Remote Functions.
- Flashing Top Light.
- Single Channel Operation.
- Remote Control Included.

Non soldering version available

Model AK-870..$24.95

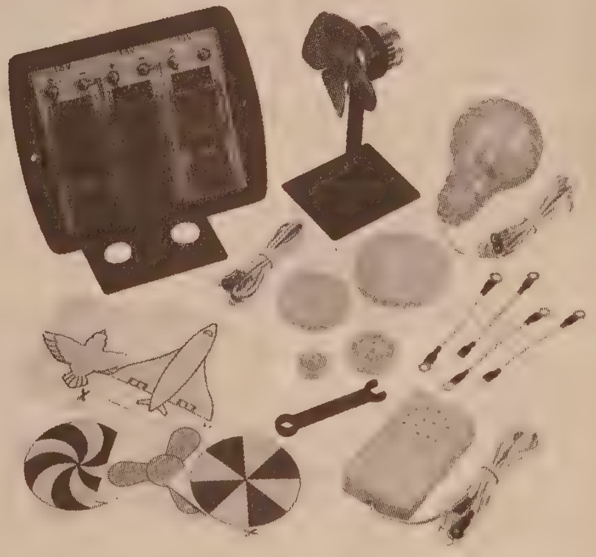
Requires 4 "AA" Batteries and 1 9V Battery

SOLAR DELUXE EDUCATIONAL KIT

Model SK-40..............................$14.95

Learn the why's and how's of solar energy. Find out how you can harness the power of the sun to convert light into electricity into a multitude of uses: light a bulb, sound a buzzer, power a fan and many others. The solar cell comes complete with 8 solar cells, electric motor, propeller, buzzer, light bulb, wires and hardware. Training manual included.

- By solar power, harness the power of the sun with this environment-friendly D.I.Y. kit!
- Children can do a series of do-it-yourself experiments to acquire the basic knowledge of solar energy.
- Children can learn how to make an electrical circuit, make a solar circuit, how to increase voltage and current, and how to use solar power to produce energy for a radio, calculator, battery charger, a cassette player and more



MULTIMETER KITS

If you are using or planning to use a digital or analog meter in your training programs, consider one of the meter kits below - easy construction, detailed assembly manuals.

Deluxe Full Function Digital Multimeter Kit

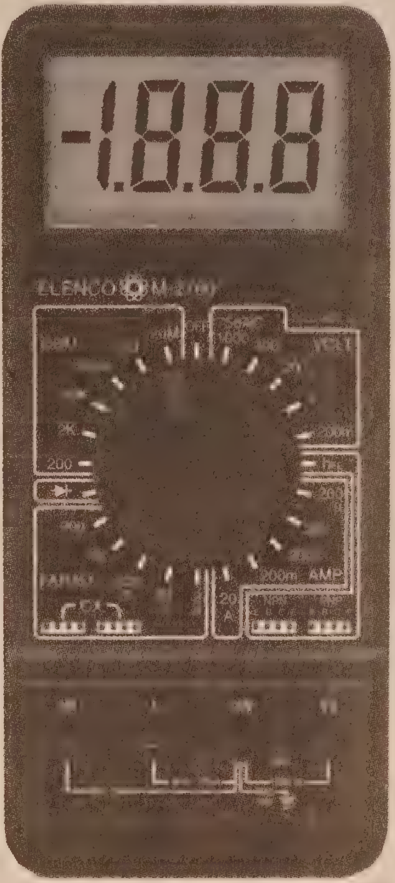
Model M-2665K..........$49.95

Features

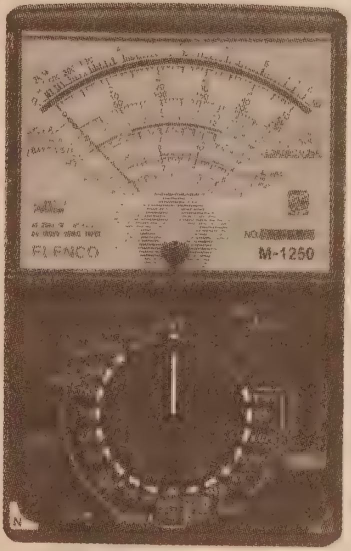
- Extra Large 1" Display.
- Transistor Test.
- Overload Protection.
- Capacitance to 20μ F.
- Diode Test.
- AC/DC Current to 20A.
- Low Battery Indicator.
- Tilt Stand.
- Safety Input Sockets and Test Leads.

Specifications

AC + DC Volts	200mV, 2V, 20V, 200V, 1,000V, 750VAC	
Accuracy	1/2% DC, 1% AC	Resolution 0.1mV
AC + DC Current	200μ A (DC only), 2mA, 200mA, 20A	
Accuracy	1% DC, 1.5% AC, 20A 2%	Resolution 0.1μ A
Resistance	200Ω, 2kΩ, 20kΩ, 200kΩ, 2MΩ	
Accuracy	.8%, 3% 20MΩ	Resolution 0.1Ω
Capacitance	2nF, 20nF, 200nF, 2μ F, 20μ F	
Accuracy	3%	Resolution 1pF
Temperature	–20°C to 1,370°C or 0°F to 1,999°F	
Accuracy	3%	Resolution 1°
Size	7 1/2" (H) x 3 1/2" (W) x 1 13/32" (D)	
Accessories	Test leads, Manual, 9V Battery included	



20K/V VOM Model M-1250K.......$21.95



Features

- 20,000Ω/V.
- 23 Ranges.
- 3 1/2" Meter.
- Mirrored Scale.
- Audible Continuity.
- Checks Transistors / Diodes.
- Safety Input Sockets and Test Leads.
- 10A DC Current.
- dB Scale.
- Battery Test.
- Tilt Stand.

DSR-85
Dial Scale Reading
Kit Included

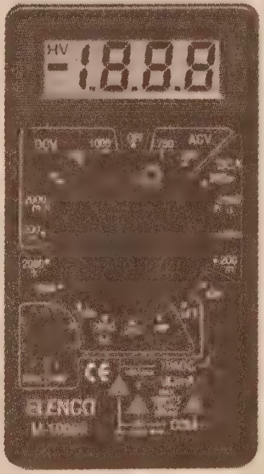
Available assembled
M-1250............$22.95

Specifications

DC Volts	0.1, 0.5, 2.5, 10, 50, 250, 1,000, 3% FSR
AC Volts	10, 50, 250, 1kV, 4% FSR
DC Current	50μ A, 2.5mA, 25mA, 250mA, 10A 3% FSR
Resistance	x1, x10, x100, x1k, x10k
Transistor h_{FE} 0-1000	ICEO 150μ A, 1.5mA, 15mA, 150mA
Size	5 29/32" (H) x 3 23/32" (W) x.1 1/4" (D)
Accessories	Test leads, Manual, 9V and (2) 1.5V AA batteries

Digital Multimeter Kit

Model M-1006K......$14.95



Features

- Low Cost.
- 3 1/2 digit LCD.
- 18 Ranges.
- Transistor Test.
- Diode Test.
- Overload Protection.
- Pocket size.

Available assembled
M-1000B.........$17.95

Specifications

DC Volts	200mV, 2V, 20V, 200V, 1,000V	
AC Volts	200V, 750V	
Accuracy	DC 1/2%, AC 1.2%	Resolution 0.1mV
Input Impedance	1MΩ	
DC Current	200μ A, 2mA, 20mA, 200mA, 10A	
Accuracy	±1.2% rdg + 2 digits	Resolution 0.1μ A
Resistance	200Ω, 2kΩ, 20kΩ, 200kΩ, 2MΩ	
Accuracy	±1.2% rdg + 2 digits	Resolution 0.1Ω
Size	5" (H) x 2 29/32" (W) x 1" (D)	
Accessories	Test leads, Manual	

ROBOT KITS & MECHANICAL MOTORIZED WOODEN KITS

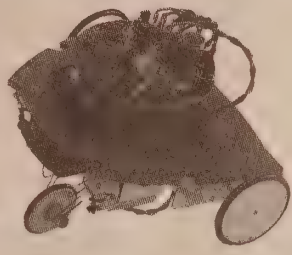
These robot kits are designed to introduce students into the exciting world of electronics. Designed with high schools and technical colleges in mind, these robot kits come complete with detailed instructions. Kits require soldering, where the PC Board needs to be assembled. The kits make great classroom projects. These kits are also ideal for the hobbyist who wants to "get his feet wet" and learn both electronics and robotics.

Hexapod Monster

The Hexapod Monster is a robot which uses infrared as its eyes. It has 6 legs so it can walk over bumpy and uneven surfaces. It turns left when it detects an obstacle then continues forward when the obstacle is clear. Includes two sets of unassemble gear motors. Uses 2 "AA" and 1 "9V" battery (not included)

21-883..$23.88

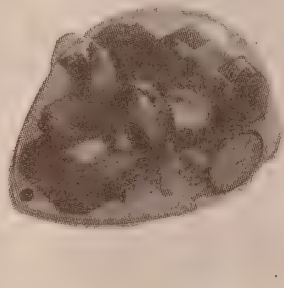
Sound Reversing Car



A Robotic Car with a sensor to detect sound, like a hand clap, or physical contact. It moves forward until it detects a noise or runs into something which will make it reverse to the left then continue on its new course. Uses 2 "AA" batteries (not included)

21-881..$18.88

Line Tracking Mouse



A smart Robot Mouse tracks a black line using a photo interrupter for its eyes. Create a twisting and turning road layout yourself with tape on a white background, see how it tracks the black line and finds the target. This kit features sound activation, programmed IC, two sets of unassembled gears, and uses 3 photo interrupters to detect a black line. Uses 4 "AA" batteries (not included)

21-880..$29.95

Turning Frog

This is an interesting Robot kit. It will go straight until it detects a sound then it will stop, the next sound will make it turn left, next sound it will stop, next sound turn right, next sound stop. Create your own obstacle course and see if your frog can make it home to its lily pad. Includes two sets of unassembled gears. Uses 2 "AA" and 1 9V battery (not included).

21-882..$21.95

WOODEN TOYS

A series of mechanical motorized wooden kits, for future engineers to design and build a gearbox by themselves.
Learn how motors and automotive transmissions work.

- Supplied with pre-punched board, pulleys, shafts, switch, motor, battery holder and all necessary parts.
- Easy to follow instructions
- Powered by 2 or 4 "AA" batteries (not included)
- Tools Required: Knife, Screwdriver, Long Nose Pliers

Stegosaurus

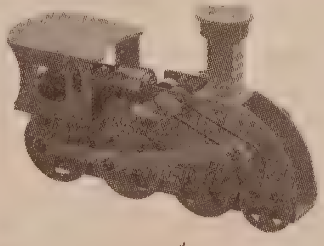
MWK-02............$15.88

Tyrannosaurus Rex

MWK-01............$15.88

Robot

MWK-03............$15.88

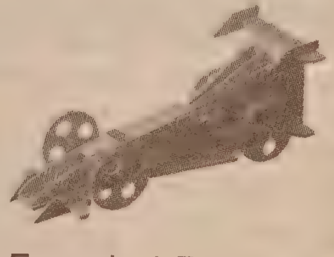


Train

MWK-06............$16.88

Helicopter

MWK-04............$15.88

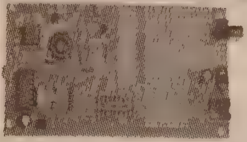


Formula 1 Race Car

MWK-05............$15.88

AMATEUR RADIO KITS

PLL-VFO Experimenter Package 440-Khz to 185-Mhz!

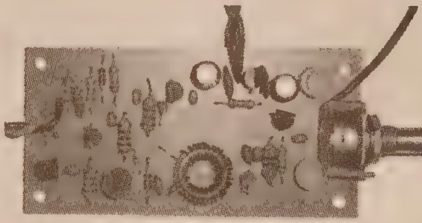


YOUR IMAGINATION IS THE ONLY LIMIT

This new VFO circuit is a two part(two board) system for the experimenter. The bottom board is he PLL and VFO, complete with an area for the experimenter to add whatever circuit he desires, such as a transmitter, receiver, transceiver, etc. The top board is a controller with a keypad for frequency entry and an LCD digital readout that displays frequency. The top board controller communicates with the MC145170 chip. This kit is not intended to be a complete kit. the circuit pair is intended to provide a highly flexible platform for the experimenter, student, or Ham radio builder. the circuits provide Rock Solid frequency control with very easy to use human interface(that's fancy for push bottom button keypad and readout). Included are circuit ideas, in schematic form, including a 2 Watt 40 Meter transmitter and receiver circuit. The prototyping area is large. The user can build a simple or multi-stage AM or FM receiver, CW rig, signal generator, etc. The circuit may be used with various oscillator designs from 440-Khz to 185-Mhz. The circuit employs an MC145170 PLL IC which provides drift free tuning with considerable stability. Operates on 12 Volts DC. You will need up to 100 Ma to power the kit plus don't forget to add enough current capability to handle your own addition to the PC board.
This kit is not recommended for beginners.

80-1401	**$89.88**

VFO KITS FOR HAM RADIO



Here are two kits that are a lot of fun to build and can be used in a number of Amateur Radio projects. Not sure what to do with a VFO? Well included with the VFO kits are schematics for a transmitter and receiver. Or use the VFO for your own projects. The circuit is a Clapp Oscillator and the designer is proud of the "triple-pot" circuit design. Two of the pots are trimmers, used to select the segment of the band that you want to tune. Select just the CW portion of the band, SSB portion, or the entire band. The narrow slice of the band that you select, the finer the main tuning will be, which can eliminate a costly ten turn pot, vernier dials, etc. These are ideal VFO's for QRP circuits.

40 Meter VFO Kit

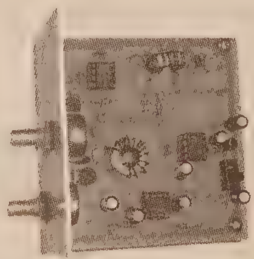
Tunes from 7.00 Mhz to about 7.300 Mhz. Included is information for making the circuit into a 30 meter VFO with some additional parts that you supply. Provision has been made for RIT/XIT offset. Buffered output: board size is 1.6" x 3.0". Operates on 12VDC.

80 Meter VFO Kit

Tunes from 3.50 Mhz to about 4.00 Mhz. Provision has been made for RIT/XIT offset. Buffered output: board size is 1.6" x 3.0". Operates on 12VDC

80-1404	**40 Meter VFO Kit**	**$18.78**
80-1408	**80 Meter VFO Kit**	**$18.78**

Amateur Radio Receiver Kits (CW, SSB) 20, 30, or 40 Meters



Compact and easy to build. Receives the entire band, CW and SSB. Great for monitoring W1AW code practice, listening to your favorite nets, etc. Small enough to take with you on field day. Operates on a 9 volt battery, and has audio output enough to drive a speaker, or use the a headset.

These circuits employ a unique three pot varator tuning system. you can set the ends of the band that you wish to receive, or receive all of the band. The advantage to receiving just a portion (say just CW or just SSB) is that the tuning becomes much more precise and can eliminate adding an expensive ten turn potentiometer in order to achieve find tuning. The PC board size is 3" x 3", which will fit nicely in a number of cases of your choice. You will need to add your own knobs (2), speaker, case, and antenna connector. You can use an SO-239, RCA connector, or BNC connector.

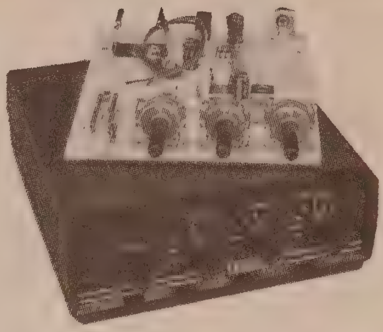
80-1420	**20 Meter Receiver Kit**	**$26.98**
80-1430	**30 Meter Receiver Kit**	**$26.98**
80-1440	**40 Meter Receiver Kit**	**$26.98**

RAMSEY RECEIVER KITS RAMSEY

FOR MORE HAM FUN...TRY QRP!!

HOT MINI-RECEIVERS

FOR...20, 30, 40 METERS



CUSTOMERS SAY:

"...just got W.A.S. on 20 in only 8 months!" J.M.
"My first contact was a G3 in England!" R.E.
"Built the HR-20 with my grandson, it will be nice to pass on the amateur tradition." B.B.
"...love it, use my QRP set-up more than my Icom 735 and Alpha!" K.L.
"...am looking forward to building the 30 meter units." H.W.

QRP MINI-RECEIVER FEATURES:

- Sensitivity of approximately one microvolt rivals the big rigs!
- Covers 500 KHz of selected band
- Receives CW, SSB and AM
- Smooth varactor diode tuning of the entire band
- Front panel RF gain control
- Convenient internal 9 volt battery supply
- Antenna input and local oscillator coils easily adjustable
- Plenty of audio output, drives any speaker or phones
- Matching case and knob sets to give a finished Professional look

PICK THE BAND (OR BANDS!) YOU LIKE:

HR-20	**AMATEUR 20 METER RECEIVER KIT**	**$39.95**
HR-30	**AMATEUR 30 METER RECEIVER KIT**	**$39.95**
HR-40	**AMATEUR 40 METER RECEIVER KIT**	**$39.95**
CHR	**MATCHING CASE AND KNOB SET**	**$14.95**

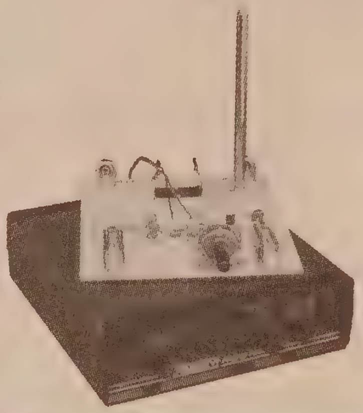
Get in on all the QRP action! These little rigs are burning up the airwaves as young and old alike are rediscovering the fun in building their own equipment. Our new detailed, step-by-step instruction manuals make building an enjoyable and rewarding experience. You're guided carefully to the completion of a unit that not only works, but will provide hours of operating pleasure. This is great, low-budget, low-poser, travel-anywhere DXing satisfation! Winter - Spring - Summer - Fall... These trusty and proven Ramsey all mode Mini-rigs are routinely used for USA & European QSO's by hams of all ages. You'll find that you don't need high power - K71RK worked and QSL'd ALL states, plus global DX QSOs from Argentina to the USSR - with only 2 mW! See 73 Magazine (Nov. 1990), "Working the World with 2 Milliwatts," by John KI6DQ. Check it out, you don't need hundreds of watts, thousands of dollars or massive equipment, you'll find it's more fun with less!

These little receivers are based upon the hot Signetics NE-602 that we read about in magazines and handbooks. The receivers are true superhetrodyne direct conversion types similar to the Heath HW-8 and 9. This simple circuit design does not require the use of IFs fancy RF filters or exotic mixers, in short - just the ideal design for easy hobby building. Only recently have high performance ICs become available that enable such circuitry to be constructed.

Beginners can easily build and enjoy these receivers exactly as designed by Ramsey engineers. Experienced amateurs and QRP enthusiasts can use them as reliable, economical, basic foundation for modifications for getting the kind performance they want, such as bandspread tuning of a favorite band segment, 12 volt operation, audio preamp or audio filter, or even digital readout on your Ramsey Electronics frequency counter! Our single PC board has plenty of room for lots of modifications and hook-ups, tinker to your hearts content - you won't go blind deciphering some small print Japanese manual. Suggestions and technical info are included in every receiver manual. Isn't this what ham radio is all about?

ACTIVE ANTENNA

eliminates outdoor wiring



Our AA-7 features both a high gain, low noise MOSFET and a superb microwave bipolar amplifier, letting you use the antenna on all bands – shortwave, HF, VHF and UHF! Imagine a self-contained unit just 4 inches square that pulls in the signals like a 60 foot long wire, that's the advantage of an active antenna. For jazzing up VHF/UHF receivers and scanners the AA-7 has you covered, too. Over 15dB of gain pulls in the weak ones, whether you use the built-in telescopic whip or an outside antenna. Features of the AA-7 are: front panel RF gain control, power switch with preamp bypass switching, two position HF and VHF/UHF selector, rear panel input and output connectors, convenient 9 volt battery operation and on board telescopic whip antenna. Finish it off with the custom case and knob set and you have a rugged compact go anywhere Active Antenna ready to toss into the suitcase for fun travel. Our detailed instructions not only guide you to a successfully completed kit, but discusses the hows and why of active antennas.

AA-7	**ACTIVE ANTENNA KIT**	**$39.95**
CAA	**CASE AND KNOB SET**	**$14.95**

A WORD ABOUT RAMSEY KITS...

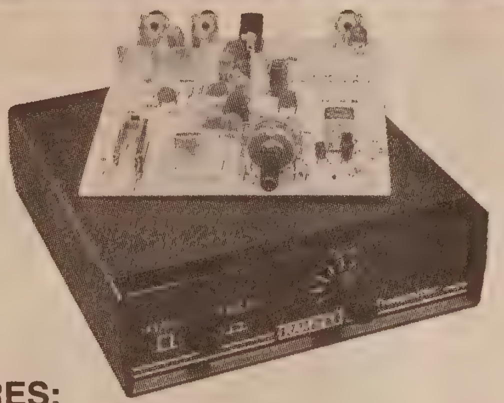
In reading this section on Ramsey Electonics products, we hope you'll find a kit or two to your liking. Ramsey has been in the hobby kit business for over 28 years and take great pride in their exciting line of easy and fun to build kits. Ramsey realizes that you build kits for not only the value they provide but for enjoyment and education also. Ramsey has put a whole new emphasis on rewriting manuals, increasing quality control and research into the latest technology. They don't believe a kit is just a bag of parts and a page or two of poorly produced instructions. A kit should: provide useful and valuable operation, be competitive with wired and tested gear in price and performance, educate the builder as to how it works and why, encourage and advise additional tinkering and modification, be well thought out for easy assembly by all levels of builders, be designed with quality components for trouble-free operation, be packed correctly with no frustrating missing parts, have an excellent manual that is easy to follow, anticipates questions and is fun to read, provide engoyment and satisfaction while building and using your kit, and lastly - create that good feeling -"I did it myself!" If they can produce kits that accomplish the above, they know you'll become hooked on building - and become a loyal repeat Ramsey customer! So, start looking, pick out a Ramsey kit or two, try our service, we know you'll be pleased!

RAMSEY QRP TRANSMITTER KITS RAMSEY

QRP TRANSMITTERS...

WORK THE WORLD ON A WATT!!

- **Clean keying**
- **VCXO Variable Crystal Controlled signal**
- **Easy 1 hour assembly**
- **Thousands in use world-wide**



QRP MINI-TRANSMITTER FEATURES:

- Four transistor circuit - oscillator, RF amplifier chain and clean keying stage
- RF output of approximately one watt (3/4 W for RTRP-20)
- Pi-network output for good matching and harmonic suppression
- Provision for two internal crystals (one crystal provided), front panel switching
- VCXO tuning, frequency can be tuned approx 7 KHz around XTAL frequency
- Operates on 12 volts DC drawing about 400-500 mA
- Internal T-R switch
- Matching case and knob set for a finished Professional look

PICK THE BAND OR BANDS YOU LIKE:

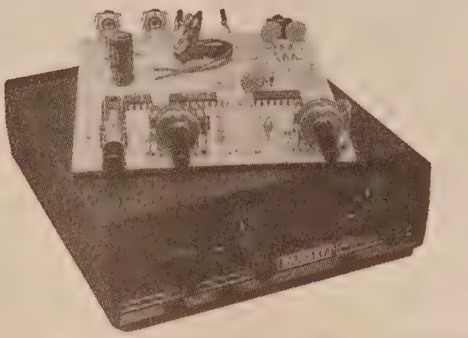
QRP-20	**20 METER TRANSMITTER KIT (includes 14.060 MHz XTAL)**	**$34.95**
QRP-30	**30 METER TRANSMITTER KIT (includes 10.108 MHz XTAL)**	**$34.95**
QRP-40	**40 METER TRANSMITTER KIT (includes 7.040 MHz XTAL)**	**$34.95**
CQRP	**MATCHING CASE AND KNOB SET FOR TRANSMITTERS**	**$14.95**

There's more to the Ramsey QRP transmitters, now available for the popular 30 and 20 meter CW bands as well as 40. A front panel switch lets you choose between two VXO controlled crystals, giving a frequency range of up to 20 KHz using just two crystals. For maximum convenience, you may wish to use the one internal crystal and a front panel crystal socket wired to the internal selector switch.

Another 'surprise' is the diode protected T-R switch we built-in. Of course, these transmitters interfaces perfectly with our QRP Mini-rig receivers and our CMOS CW keyer! All models have exceptional instruction manuals - over 20 pages! -with detailed step-by-step instrucions that guide you to a perfectly operating finished transmitter.

Just as there's plenty of room in our QRP receivers for user designed enhancements and modifications, there's even more room in our QRP transmitters. How about adding a 10 watt PA stage, a sidetone generator, computer keying interface, or even a receiver front-end similar to our Mini receiver for true transceiver configuration. Modify "till-the-cows-come-home," or just use 'em as they are, you'll find lots of fun and enjoyment with our QRP transmitters.

EASY-KEY CW KEYER



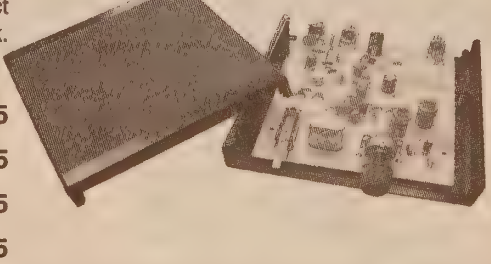
Add to your CW fun with our low cost CMOS Keyer Kit. You'll send clean code that's a pleasure to copy, self completing dots and dashes with properly weighted spacing and timing are all programmed into the CW-7's design. Assembly of the keyer is fast, easy and fun, our step-by-step instructions lead you to a finished unit in only one evening. For beginners, the CW-7 makes an ideal code practice oscillator – learn the sound of perfectly formed CW right from the start and have a fine piece of ham gear, too! Built-in sidetone, adjustable pitch, front panel speed and volume controls and convenient 9 volt operation are featured. The CW-7 is the ideal companion to our QRP transmitters or any other rig you may own. Manual also includes details on constructing economical CW paddles. To give your project a finished, 'store-bought', professional look, use our custom case and knob set that also matches our QRP receivers and transmitters.

- **Works great on any rig**
- **Perfect CW in one night**
- **Ideal for code practice, too!**

CW-7	**CMOS KEYER KIT**	**$34.95**
CWC	**MATCHING CASE SET**	**$14.95**

20 WATT POWER AMP CUTS THRU QRM

Need a little extra boost for your QRP rig? This nifty little amplifier may be all you need. Believe it or not, 20 watts is only 7 dB (about one S unit!) less power than a full sized commercial transceiver. This compact amplifier is easily driven by any of our QRP transmitters or any other unit in the 1/2 - 2 watt range. Advanced power MOSFETs are used for the utmost in efficiency and purify, while a multistage low pass filter is used to assure a clean signal output. Power required is only 12 VDC at 2 to 4 amps, depending upon power output. Complete step-by-step instructions are provided which makes building the kit a breeze. The amplifier works well for all modes; CW, SSB, and AM. Select the band of interest to you and don't forget our custom matching case set for a complete station look.



QAMP-20	**20 METER 20 WATT QRP POWER AMPLIFIER KIT**	**$49.95**
QAMP-30	**30 METER 20 WATT QRP POWER AMPLIFIER KIT**	**$49.95**
QAMP-40	**40 METER 20 WATT QRP POWER AMPLIFIER KIT**	**$49.95**
CQAMP	**MATCHING CASE SET**	**$14.95**

RAMSEY

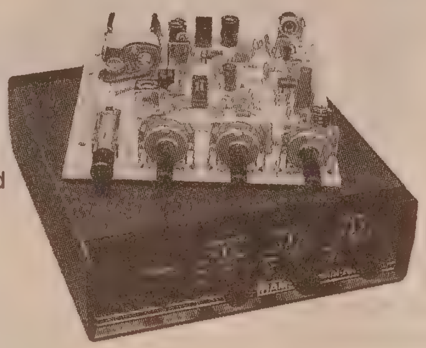
RECEIVER KITS

RAMSEY

VHF MINI-RECEIVERS low cost, easy and fun to build

CHECK OUT THESE FEATURES:

- Dual-conversion superhet design reduces image responses
- Sensitivity that rivals full size receivers - less than 1 uV
- Sharp ceramic filters in both the high and low IF stages
- Fully tunable over any 5 MHz portion of band
- AFC circuitry reduces any drift effects
- Positive acting, adjustable squelch
- Smooth varactor diode tuning
- Crystal controlled 2nd local oscillator
- Plenty of audio to drive any speaker
- Microwave transistor RF amp stage
- Runs on standard 9 volt battery
- Uses the new Motorola FM receiver on-a-chip and the hot Signetics NE-602
- Easy and fun one evening assembly
- Matching case and knob set gives a professional look



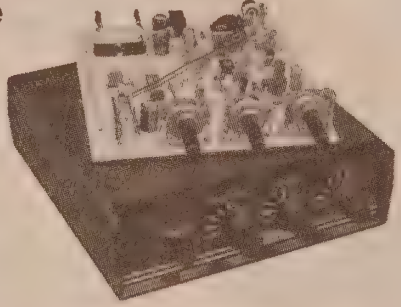
FR-6 AMATEUR 6 METER (tunes 40-60 MHz) RECEIVER.	**$39.95**
FR-10 AMATEUR 10 METER (tunes 25-35 MHz) RECEIVER	**$39.95**
FR-146 AMATEUR 2 METER (tunes 130-180 MHz) RECEIVER	**$39.95**
FR-220 AMATEUR 220 MHz (tunes 200-240 MHz) RECEIVER	**$39.95**
CFR MATCHING CASE AND KNOB SET FOR RECEIVER KIT	**$14.95**

You get a lot for your money with any one of these dual-conversion FM receivers. In just one evening of building fun, you can be snooping around the band, monitoring the local repeater, checking out new bands, or even eavesdropping in on the local police and businesses. There are no short cuts taken in the design of these units, sensitivity is equal to full size monitor receivers or scanners. Schools, scout troops, clubs and hobbyists use these receivers for teaching, monitoring, and just plain building enjoyment. Any one of these little receivers are ideal for easy chair listening - and with no big clunky box and wiring to aggravate the XYL!

All four receivers can be tuned outside of the intended amateur bands. For example, the FR-146 two meter receiver will tune any 5 MHz segment from 130 to 180 MHz. Choose your band and enjoy FM repeater and simplex monitoring on a budget! Help a newcomer discover the 220 MHz novice band. Listen in on exciting 10 Meter international FM action. Rediscover the fascination of 6 Meter sporadic E band openings and uncrowded new FM repeaters. For a professional finished look, our matching case and knob set can't be beat. Kit includes detailed, step-by-step manual of 28 pages that carefully guides you to a finished working radio.

AIRCRAFT RECEIVER

...puts you in the pilots seat!!

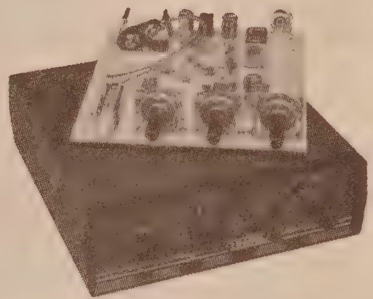


Tune into the exciting world of aviation. Listen to airlines, big business corporate jets, hot-shot military pilots, local private pilots, control towers, approach and departure radar control and other interesting and fascinating air-band communications. You'll hear planes up to a hundred miles away as well as all local traffic. The AR-1 features smooth varactor tuning of the entire air band from 118 to 136 MHz, effective AGC, superhetrodyne circuitry, squelch, convenient 9 volt operation and plenty of speaker volume. Don't forget to add our matching case and knob set for a fine looking project you'll love to show. Our detailed instruction manual makes the AR-1 an ideal introduction to two life-long fascinating hobbies at once – electronics and aviation!

AR-1	**AIRCRAFT RADIO KIT**	**$39.95**
CAR	**CASE SET FOR AR-1**	**$14.95**

SHORTWAVE RECEIVER

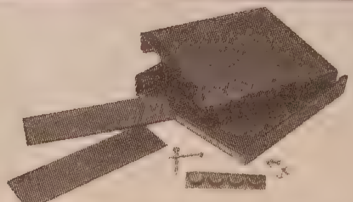
Many folks ask us, "What kit would be beat for a young person, to get them interested in radio?" We find that this shortwave receiver kit is ideal and has been used by schools, scouts and moms and dads to inspire and challenge their kids.



Here's a complete shortwave radio guaranteed to inspire awe in any listener. Imagine tuning in the BBC, Radio Moscow, Radio Bagdhad and other services with just inches of antenna. This very sensitive (about a microvolt!) receiver is a true superhet design withAGC, RF gaincontrol and plenty of speaker volume. Smooth varactor diode tuning allows you to tune any 2 MHz portion of the 4 to 19.5 MHz frequency range, and the kit conveniently runs on a 9 volt battery. Add our matching custom case and knob set to give your radio a finished, polished look. This kit is very popular with schools, scouts and corporate presidents! Amaze yourself - and others- see how you can listen to the world on a receiver you built in an evening.

SR-2	**SHORTWAVE RADIO KIT**	**$39.95**
CSR	**CASE AND KNOB SET**	**$14.95**

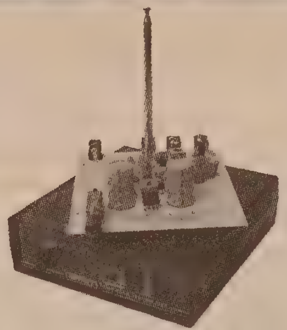
ABOUT RAMSEY MATCHING CASE SETS...



Ramsey's matching cases for their HF receivers and transmitters, VHF kits, speech scramblers and more are the same rugged ABS enclosures used for Ramsey frequency counters. The case kit provides enclosure, mounting hardware, correct front and rear panels - punched, drilled and handsomely printed with appropriate legends, rubber feet and nice control and switch knobs. Most switch and control placement is common through all kits, thus providing a complete station look when multiple projects are combined. If you've priced enclosures and even knobs recently, we think you'll appreciate the value of these attractive enclosure kits.

GREAT KITS BY RAMSEY

TV TRANSMITTER

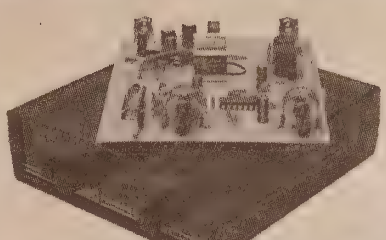


Send your TV signals throughout the house!

Ever wanted to watch your VCR in another room, but without stringing extra wires? This great little kit allows you to send any audio and video source (like a VCR or TV camera) to any TV set for up to 300 feet. Have your own TV station with YOU playing producer and YOUR selection of programming! And, the nice feature of this kit is that you'll learn just how a TV transmitter works, we explain every part of the circuit from A to Z. Tunable to any TV channel 2 - 6, runs on 12 VDC, and accepts standard audio and video signals. Our matching custom case set gives a clean finished look to your transmitter.

TV-6	**TV TRANSMITTER KIT**	**$39.95**
CTV	**MATCHING CASE SET**	**$14.95**

SCA DECODER FOR COMMERCIAL FREE MUSIC



Ever wonder how restaurants and hotels get their continuous, commercial-free background music?

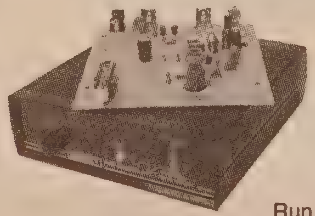
Believe it or not, they get it off the local FM radio station, but with a special decoder. Now you can build your own decoder and tap into the wealth of programming available to those "in the know". Programming available runs the gamut from stock quotes to rock music to easy listening to all news. These services are "hidden" in subcarriers riding along with the standard FM radio station's usual programming. The decoder connects to the detector output on an FM receiver. Tune into what you've been missing, try the SCA-1.

- Tunes entire SCA subcarrier band 50-100 KHz
- Feature both speaker and in-line audio outputs
- Simply plugs into our FR-1 FM broadcast receiver

Add our matching case set for the final finishing touch.

SCA-1	**SCA DECODER KIT**	**$39.95**
CSCA	**MATCHING CASE SET**	**$14.95**

AM RADIO TRANSMITTER

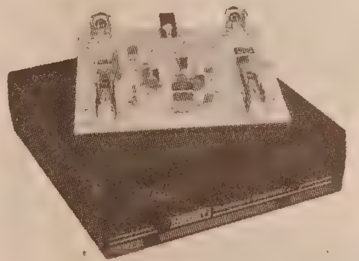


Play disk jockey or talk show host!

Run your own AM radio station, be the latest talk-show host or top 40 DJ. The Ramsey AM-1 radio transmitter operates in the standard AM broadcast band and is easily tunable to any clear channel in your area. The AM-1 is designed very similar to actual commercial radio transmitters, so you'll learn how the "big-boys" operate and use their transmitters. Transmitter power is 100 milliwatts so no FCC license is required, expected range is up to 1/4 mile depending upon antenna and conditions. The AM-1 accepts standard line-level inputs from tape decks, CD players or mike mixers, and runs on 12 volts DC. You'll find plenty of uses for this handy little transmitter, from sending radio calls throughout the house to playing games with the dedicated Rush Limbaugh listener. Don't forget to add our custom matching case and knob set for a finished professional look.

AM-1	**AM RADIO TRANSMITTER KIT**	**$34.95**
CAM	**MATCHING CASE SET**	**$14.95**

SHORTWAVE CONVERTER



Bring some interest to those long commutes to and from work, this shortwave converter is the ticket. The SC-1 converter brings the sounds of the world right into your car radio or home stereo (set to AM broadcast band). Front panel push switch lets you choose between regular AM radio and the shortwave bands. An additional switch allows the selection of any two bands of interest, each 1 MHz wide. Set one range for daytime frequencies and one for nighttime when propagation is different, choose any two frequencies between 3 and 22 MHz. Frequencies are tuned on your AM radio, making it easy to log stations or set presets. Built-in antenna switch automatically switches existing AM antenna to either the radio or converter, making hook-up easy. A handsome matching case and knob set puts the finishing touches on your kit.

SC-1	**SHORTWAVE CONVERTER KIT**	**$39.95**
CSC	**MATCHING CASE AND KNOB SET**	**$14.95**

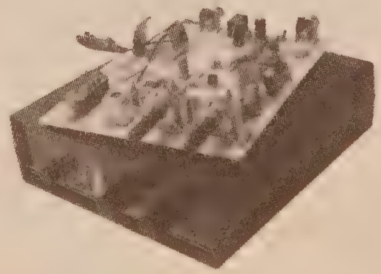
FM BROADCAST RECEIVER

Perfect for tuning "Out-of-Band"

- **Standard FM receiver, with larger range of 70 to 110 MHz**
- **Ideal for FM wireless mikes, SCA programming, or just normal FM broadcasts**
- **Demodulated audio output for driving our SCA1 decoder**

Ideal for standard FM broadcast band as well as large portions on each side, making it great for bug monitoring or detection and receiving SCA broadcasts. Features one micovolt sensitivity, 10.7 MHz IF, 250 mW audio output, varactor diode tuning, IC FM detector chip, demod output to drive our SCA1 decoder and operates on 9 VDC battery (not included). Drives any 4-45 ohm external speaker. Add our handsome matching case, knob and antenna set for a nice finished look.

Optional case size 5"W x 5 1/4"d 1 1/2"H.

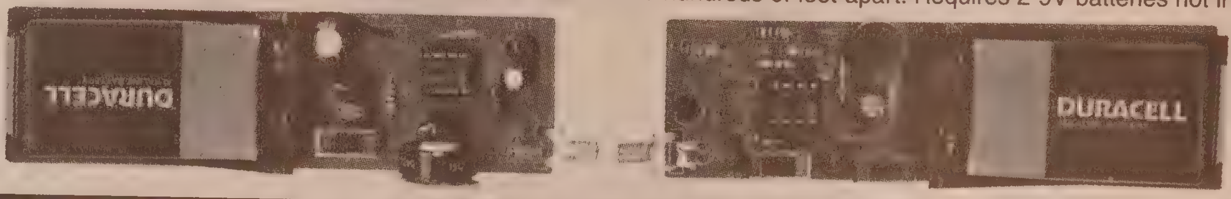


FR1	**FM Broadcast Band Receiver Kit**	**$34.95**
CRR	**Matching Case & Knob Set for FR1**	**$14.95**

Fiber Optics Kit with training course

Model FO-30K.......................................$19.95

Learn the basics of fiber optics communications while you build this exciting kit. Transmit your voice or a 1kHz signal through the fiber optic cable to a fiber optic receiver. Comes complete with all of the necessary components, including PC boards, microphone, speaker and fiber optic cable. Transmitter and receiver on separate boards, can be located hundreds of feet apart. Requires 2-9V batteries not included.



Fiber Optic Lab Kit

with training course

Model FO-40K.......$49.95

The course includes a 61 page manual and all of the material necessary to conduct nine stimulating experiments related to fiber optic communications. The experiments will give you a better understanding of fiber optics techniques and real fiber optics hardware.

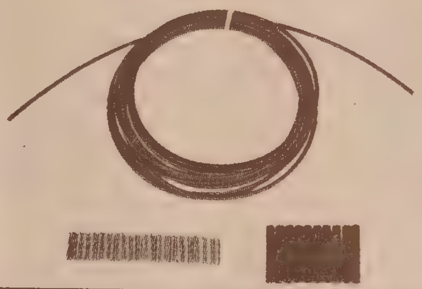
Fiber Optic Tool Kit

Model TK-50.........$146.95

For use on 1,000μm plastic fiber. With this kit there will be no nicked or damaged fibers. It contains a ***no nick fiber stripper***, hot knife cutting tool, termination fixture and carrying case.

Fiber Optic Splice Kit

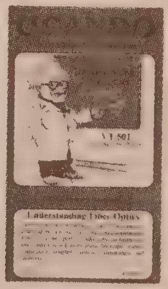
Model TK-25.................$9.95



For mending or extending 1,000μm plastic fiber. It contains fiber sleeves and retention clips to complete ten splices. No special tools, polishing or adhesive required. Instructions included.

Understanding Fiber Optics

Model VT-501...........................$39.95



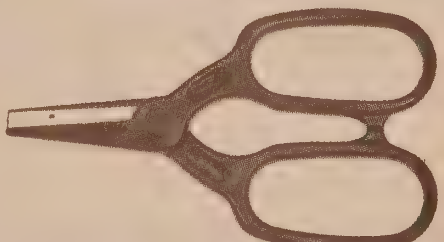
Learn tomorrow's technology today! Fiber optics is changing the way we live, think and communicate. You will learn about fiber optic cables, connectors, couplers, splicers, transmitters and receivers.
58 minutes viewing time.

Ceramic Kevlar® Cutter

Model ST-340.................$29.95

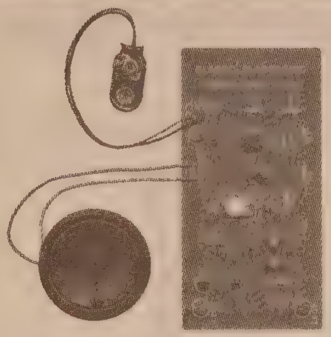
Easily trim Kevlar strength member in fiber optic cable. The ceramic blades cut Kevlar quickly and precisely.

Kevlar® is a registered trademark of the E.I. Dupont Company.



Fiber Optic Cable

Part # 810020 - 1,000μm Core Plastic Fiber Optic Cable - Sold per foot.....................	$.95/FT
Part # 810021 - Plastic Fiber Duplex Cable - sold per foot..	$1.80/FT



Practical Soldering Project Kit

Model SP-1A.......$8.95

Working with printed circuit boards is in the future of every electronic technician. Almost every electronic device today has a printed circuit board and whether you are assembling a PC board or repairing it, you must understand the basics of working with these boards.

Good soldering requires practice and an understanding of soldering principles. This solder practice project will help you achieve good soldering techniques, help you become familiar with a variety of electronic components, and provide you with dynamic results.

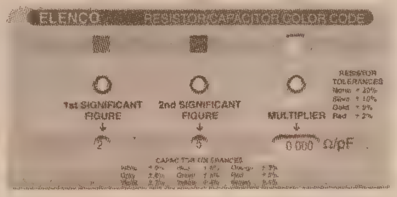
The Finished kit is a european siren with flashing lights.

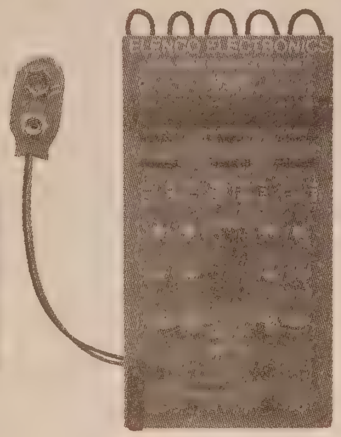
Practical Soldering Project Kit

Model SP-3B......$8.95

Elenco Electronics is proud to present another superb solder practice kit designed to meet the ever increasing demands on proper soldering procedures. Some of the features of this kit are as follows:

- Identifying components
- Color code reading exercises, resistors, capacitors, and inductors. **Includes color code calculator**.
- 163 solder points, standard soldering connections, close-tolerance soldering, and tack soldering.
- Desoldering exercise
- Evaluation exam of performed soldering connections. Written & visual.
- Requires 1-9 volt battery (not included)





Telephone Kit

Model AK-700.........$17.95

Clear, See-Through Case with Training Course

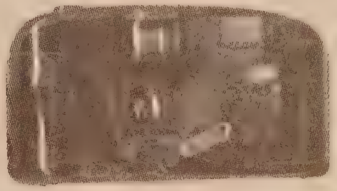
The Elenco AK-700 is a push button electronic telephone. It is equipped with the following features: Pulse/tone dialing, automatic redial, a ringer turn off switch, 4 neon bulbs for visual indication of telephone ringing, and a clear see-through case to show the total inner workings of the phone. Sectionalized construction and testing makes construction easy. Wall mounting cradle included.

Non Soldering Version Available

Model AK-750.........$18.95

35mm Camera Kit w/Flash and Training Course

Model AK-560.............$15.95



Now you can learn all about photography with our new Camera Kit. Our training manual will teach you everything you need to know about light, film speed, exposure, development, and much more! And best of all, you will have a working camera "you built" when you are finished. No soldering required.

Talking Clock Kit

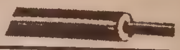
Model AK-220.............$14.95

This easy-to-build kit will teach you how electronic voices are made. No soldering is required and our full color assembly manual takes you step by step in putting it together. Features hourly reports and rooster crow for alarm.

WIRE AND CABLE

HOOK UP AND LEAD WIRE

GENERAL PURPOSE HOOK UP WIRE RATED 300V WITH PVC JACKET. AVAILABLE ON EITHER 100' OR 1000' SPOOLS. MEETS UL1007



28 GAUGE STRANDED

PART NO.	COLOR	100'	1000'
HW28BK	BLACK	5.95	49.00
HW28RE	RED	5.95	49.00
HW28WE	WHITE	5.95	49.00
HW28GN	GREEN	5.95	49.00
HW28YW	YELLOW	5.95	49.00
HW28BE	BLUE	5.95	49.00

26 GAUGE STRANDED

PART NO.	COLOR	100'	1000'
HW26BK	BLACK	4.95	39.90
HW26RE	RED	4.95	39.90
HW26WE	WHITE	4.95	39.90
HW26GN	GREEN	4.95	39.90
HW26YW	YELLOW	4.95	39.90
HW26BE	BLUE	4.95	39.90

24 GAUGE STRANDED

PART NO.	COLOR	100'	1000'
HW24BK	BLACK	5.95	39.90
HW24RE	RED	5.95	39.90
HW24WE	WHITE	5.95	39.90
HW24GN	GREEN	5.95	39.90
HW24YW	YELLOW	5.95	39.90
HW24BE	BLUE	5.95	39.90

24 GAUGE SOLID

PART NO.	COLOR	100'	1000'
HWS24BK	BLACK	5.95	38.70
HWS24RE	RED	5.95	38.70
HWS24WE	WHITE	5.95	38.70
HWS24GN	GREEN	5.95	38.70
HWS24YW	YELLOW	5.95	38.70
HWS24BE	BLUE	5.95	38.70

22 GAUGE STRANDED

PART NO.	COLOR	100'	1000'
HW22BK	BLACK	5.95	40.95
HW22RE	RED	5.95	40.95
HW22WE	WHITE	5.95	40.95
HW22GN	GREEN	5.95	40.95
HW22YW	YELLOW	5.95	40.95
HW22BE	BLUE	5.95	40.95

20 GAUGE STRANDED

PART NO.	COLOR	100'	1000'
HW20BK	BLACK	6.95	57.95
HW20RE	RED	6.95	57.95
HW20WE	WHITE	6.95	57.95
HW20GN	GREEN	6.95	57.95
HW20YW	YELLOW	6.95	57.95
HW20BE	BLUE	6.95	57.95

18 GAUGE STRANDED

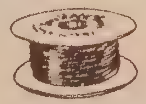
PART NO.	COLOR	100'	1000'
HW18BK	BLACK	7.95	64.00
HW18RE	RED	7.95	64.00
HW18WE	WHITE	7.95	64.00
HW18GN	GREEN	7.95	64.00
HW18YW	YELLOW	7.95	64.00
HW18BE	BLUE	7.95	64.00

26 GAUGE SOLID

PART NO.	COLOR	100'	1000'
HWS26BK	BLACK	4.95	39.90
HWS26RE	RED	4.95	39.90
HWS26WE	WHITE	4.95	39.90
HWS26GN	GREEN	4.95	39.90
HWS26YW	YELLOW	4.95	39.90
HWS26BE	BLUE	4.95	39.90

MAGNET WIRE

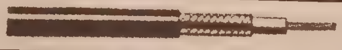
Enamel coated copper. For winding Coils, Toroids, and Transformers. All prices for 1/4lb spools. This is a standard round, pure copper wire with a polyamide enamel inner-coat and polyurethane over coat; Thermo Class 130. The insulation will stand up and not crack during winding of tight coil, high speed winding etc.



P/N	SIZE	FOOTAGE	PRICE
MW14	14	20	4.10
MW16	16	32	4.25
MW18	18	51	4.40
MW20	20	81	4.50
MW22	22	129	4.70
MW24	24	204	4.85
MW26	26	327	4.95

P/N	SIZE	FOOTAGE	PRICE
MW28	28	520	5.50
MW30	30	825	5.75
MW32	32	1290	6.20
MW34	34	2080	6.80
MW36	36	3300	7.25
MW38	38	5150	7.80
MW40	40	8600	9.25

COAXIAL CABLE



PART NO. RG TYPE	DIA. (IN.)	CENTER CONDUCTOR	INSULATION TYPE	SHIELD COVERAGE	JACKET TYPE	IMP. (OHMS)	VEL. FACTOR	LOSS/100' @100 MHz	PRICE/FT. 1-499'	500 ROLL
RG 58/U	.195	#20 SOLID COPPER	POLYETHYLENE	95% TINNED COPPER	PVC	50	66%	4.5 dB	.15	47.05
RG 58A/U	.195	#20 STRANDED TINNED COP.	FOAM POLYETHYLENE	88% TINNED COPPER	PVC	50	66%	4.7 dB	.17	64.40
RG 6/U	.270	#18 SOLID COPPER	FOAM POLYETHYLENE	100% FOIL +46% ALUM. BRAID	PVC	75	78%	2.1 dB	.13	48.10
RG 8/X	.240	#16 STRANDED COPPER	FOAM POLYETHYLENE	95% BARE COPPER	PVC	50	78%	3.6 dB	.20	76.90
RG 8/U	.405	#13 STRANDED COPPER	FOAM POLYETHYLENE	97% BARE COPPER	PVC	50	66%	1.8 dB	.42	161.75
RG 213/U	.405	#13 STRANDED COPPER	POLYETHYLENE	97% BARE COPPER	NON-CONTAM. PVC	50	66%	2.2 dB	.46	164.30
RG 59/U	.240	#22 SOLID BARE COPPER	POLYETHYLENE	95% BARE COPPER	PVC	75	66%	3.3 dB	.15	59.20
RG 174/U	.060	#26 7/34 BARE COPPER	POLYETHYLENE	88% TINNED COPPER BRAID	PVC	50	66%	6.6 dB	.15	48.40

DUE TO THE INSTABILITY OF THE COPPER MARKET, PRICES ARE SUBJECT TO CHANGE.

WIRE AND CABLE

SHIELDED MULTICONDUCTOR CABLE

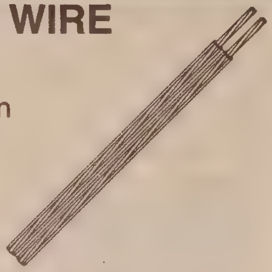
- 100% Aluminum/Foil Shield
- Stranded Conductors
- PVC Jacket
- Tinned Stranded Drain Wire (#24)
- 300V 75°C

PART NO.	NUMBER CONDUCTORS	AWG (STRAND)	NOMINAL O.D.	PRICE 1-499'	500' ROLL	1000' ROLL
SMC222	2	22 (7/30)	.137	.13	38.50	64.30
SMC322	3	22 (7/30)	.151	.16	45.90	78.05
SMC422	4	22 (7/30)	.173	.18	50.95	89.90
SMC522	5	22 (7/30)	.181	.22	58.75	105.40
SMC622	6	22 (7/30)	.193	.24	67.10	121.00
SMC822	8	22 (7/30)	.215	.29	81.45	147.85

SPEAKER WIRE

- 2 Conductor
- PVC Insulation
- Clear Color
- 300V

Available on 50' and 100' rolls



P/N	GAUGE	50'	100'
SW2110	#24	3.80	6.30
SW2115	#22	4.45	7.70
SW2120	#20	5.70	10.25
SW2125	#18	7.60	13.20
SW2130	#16	9.90	18.30

ANTENNAS & ANTENNA ACCESSORIES

ROTOR CABLE

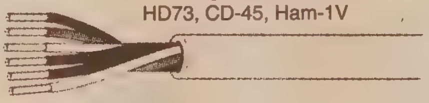
APPLICATIONS

- Ham/CB rotors
- TV rotors

CONSTRUCTION/SPECIFICATIONS

- Bare copper conductors
- PVC insulation
- Color coded conductors
- PVC jacket
- 200V rating
  – 20°C to + 60°C

*CAT. # 5971used on the following ham ROTORS: HD73, CD-45, Ham-1V

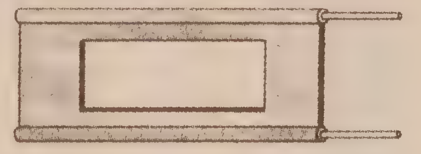


CAT. NO.	NO. OF COND.	CONDUCTOR AWG (STRAND)	INSUL. NOMINAL WALL	NOM. JACKET WALL	NOM. O.D.	PRICE 1-499	500' ROLL
5932	3	20 (7/28)	.010	.020	.162	.16	41.50
5942	4	20 (7/28)	.010	.020	.176	.19	54.60
5961	8	22 (7/30)	.010	.020	.206	.24	73.85
5971	8	6-22 (7/30) 2-18 (16/30)	.012 .016	.020 .030	.162 .260	.32	89.40

450 OHM LADDER LINE

This 450 ohm cable is specifically designed with low loss & high strength qualities required for very long transmission line runs and ham antenna installation. 50' minimum purchase required.

Size wire 18 AWG SOLID

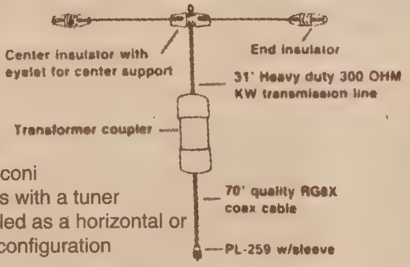


PART NO. LL-450
PRICE

1-499	500' ROLL	1000' ROLL
.15	$51.50	$94.30

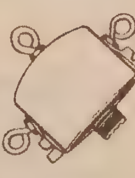
FAMOUS G5RV

- Completely assembled
- 102' long overall
- 2 kw PEP
- All bands 3.5 - 30 MHz
- Use as a marconi on 160 meters with a tuner
- May be installed as a horizontal or inverted vee configuration


Center insulator with eyelet for center support
End insulator
31' Heavy duty 300 OHM KW transmission line
Transformer coupler
70' quality RG8X coax cable
PL-259 w/sleeve

G5RV **$49.95**

HI-Q ANTENNA CENTER INSULATOR



- Small, rugged, lightweight, weatherproof
- Replaces center insulator
- Handles full legal power and more
- With SO 239 connector

ACI-2 .... **$6.95**

HI-Q BALUN

- For dipoles, yagis, inverted vees and doublets
- Replaces center insulator
- Puts power in antenna
- Broadbanded 3-40 MHz
- Small, lightweight and weatherproof
- 1:1 or 4:1 Impedance ratioavailable
- For full legal power and more
- Helps eliminate TVi
- With SO 239 connector
- Built-in DC ground helps protect against lightning

AB-2... 1:1 ratio **$14.95**
AB-3... 4:1 ratio **$14.95**

ANTENNA WIRE

The ideal wire for making antennas. Strength is achieved with copper coated steel wire, stranded for greater flexibility and ease and handling. The copper assures excellent conductivity and good soldering properties. The wire is #14 copperweld made up of 7 strands of #22 wire.

Must order in multiples of 25 feet, 50 foot minimum purchase required

14BC .... **$.14/ft.**

ANTENNA INSULATORS

Light-weight, durable molded tenite plastic. Dielectric strength is comparable to its ceramic predecessor without susceptibility to cracking or breakage under impact or severe temperature change. Weatherproof.

2130CP **$1.75/pair**

ANTENNA INSULATORS

Same as above only ceramic.

10-06 .... **$4.90/pair**

DIPOLE CENTER INSULATOR

Constructing a dipole is easy with the HQ-1 center insulator. Attach each "arm" of your dipole to this device and then screw your PL-259 into the center! You get easy assembly, the best connection, the the strongest support and the most weatherproof fit.

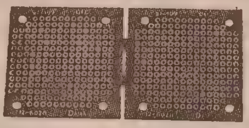
HQ-1 .... **$7.95**

PC PROTOBOARDS

PROTOBOARDS for quick, easy circuit assembly.

Protoboards are ideal for the assembly of your "one only" circuits or pre-production prototypes. All have copper on one side, drilled to accommodate component leads and ready to solder. The industry standard component lead-spacing of 1/10" inch is adhered to in all boards. Except for the smallest board, the component side is silk-screened so that you will know where the copper conductors are located on the opposite side of the board. Board material is 1/16" inch thick phenolic with one ounce of copper.

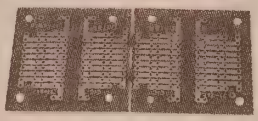
Experimenters general purpose mini-board.



1.80"W x 3.60"L

12-602 .... **$1.90**

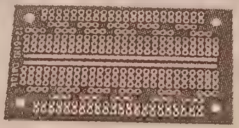
I.C. Experimenter's board.



1.40"W x 3.60"L

12-607 .... **$1.90**

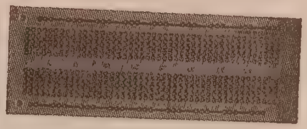
Small PC board, featuring drilled copper pads connected (via traces) in groups of two and three to accommodte circuits with a lot of common tie points.



1.70"W x 2.90"L

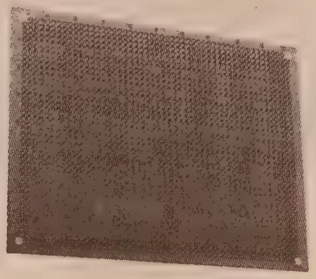
12-611 .... **$1.30**

This medium size (5.10"L x 1.90"W) board has plenty of room for medium sized circuits with several IC's and a lot of components.



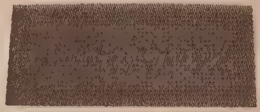
12-617 .... **$2.20**

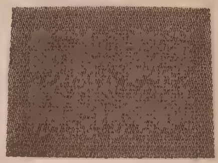
This is a big board that will contain circuits of considerable size. Board size is 5.50" x 4.30", the drilled hole and pad count is over 1,900.

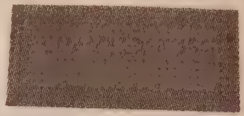


12-600 .... **$3.95**

PERFORATED "XXP" PHENOLIC CIRCUIT BOARDS







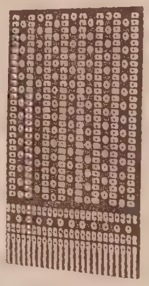
Unexcelled for prototypes, breadboards, hobby or science projects. Made of tough phenolic with punched holes. Boards are bare phenolic —

NO COPPER CLAD.

Std. board "A" .0.93" holes; 0.265" spacing
22-518 .... **(3 3/4" wide x 8" long)** **$5.85**

Microboard "P" .0.042" holes; 0.100" spacing
22-514 .... **(2 1/4" wide x 6" long)** **$3.30**

22-516 .... **(4 1/2" wide x 6" long)** **$4.75**

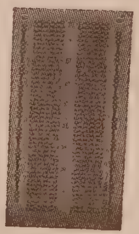


PLUG-IN IC PHENOLIC

Prototype Board

IC's plug directly into board. 0.1" spacing accepts 14 pin or 16 pin IC's, up to 20 pin IC's. Silver plated lands with 24-way card edge connector plug on one end. Made of tough pheonolic.).1" centers x 2-3/8" wide x 4" long x 1/16" thick, .035" holes.

22-500 .... **$3.60**



EXPERIMENTER'S PHENOLIC

Prototype Board

Ready-to-use copper plated printed circuit board has 550 solder tie-points. 94 five-point terminals and two 40-point buss strips on 0.3" centers. Phenolic board has prepunched holes, mounting holes. 2" wide x 6" long x 1/16" thick.

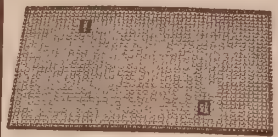
22-508 .... **$7.60**

VERSA STRIP PHENOLIC

Prototype Board

Alpha numerical indexing. Silver plated land patterns. Predetermined short tracks for multi IC work. 0.1" centers x 3-1/2" wide x 6" long x 1/16" thick, .035" holes.

22-502 .... **$6.95**



PRINTED STRIP PHENOLIC

Prototype Board

Alpha-numerical indexing. Tinplated land patterns for positive pin identification. 0.1" centers x 3-1/2" wide x 6" long x 1/16" thick, .035" holes. 3" x 4"

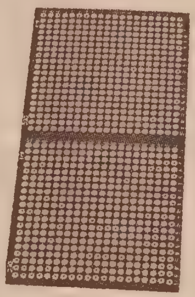
22-506 .... **$5.95**

EXPORT DESIGN PHENOLIC

Prototype Board

Accommodates all types of IC's, transistor packages and passive parts. Lands and buss bars are tinplated. 0.1" centers x 3 1/8" wide x 5 1/16" long x 1/16" thick.

22-504 .... **$3.85**

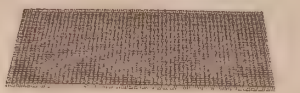


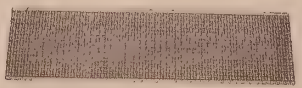
EXPERIMENTER'S PHENOLIC

Prototype Board

Save time and money with ready-to-use printed circuit boards. Excellent for use in protype building, experimenting, hobby or science projects and kit building. made of tough phenolic with .03" punched holes. Choice of single or quad land pattern. 3-3/8" wide x 6-3/4" long x 1/16" thick.

22-510 (Quad Land Pattern) **$5.75**
22-512 (Single Land Pattern) **$5.75**





STRIP PROTOBOARDS

Copper strips on one side, 0.40" diameter holes are on 0.10" centers to accept common component leads. The strips run full length but user may break them up using an Xacto knife. These are handy for prototyping and may be cut with sheet metal sheer, hack saw etc. to make smaller boards. The board is xxp phenolic materal.

12-618 (SIZE 3 15/16" WIDE X 6 5/16" LENGTH) **$3.05**
12-619 (SIZE 3 15/16" WIDE X 9 13/16" LENGTH) **$4.20**

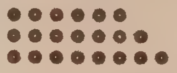
DATAK DIRECT ETCH™ RESIST PATTERNS DATAK

Datak Direct Etch Patterns allow you to make PC Boards without creating artwork. Apply DE-series patterns directly to the copper PC board surface by rubbing them down in the circuit pattern that you want. Connect between component patterns either with rub-down, DE-series lines or with edge resist tapes.

DE-series resolution is superb; resists lines down to .015" etch cleanly with about .001" undercut in a manual etch bath; far better in a spray etch tank.

These packages, all of which have part numbers beginning with a "DE-" prefix, contain two identical sheets (1.5" x 5") of patterns. Burnished directly onto copper surface; circuits typically etch with less than .001" undercut. DE-series patterns may also be used for 1:1 PC artwork.

PRESPACED DONUT PATTERNS



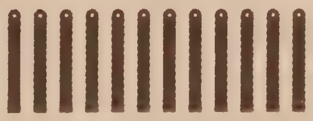
CAT. NO.	OD" x ID"	CENTER TO CENTER SPACING (L" x W")	QUAN.	PRICE
DE-1	.050 x .015	.100 x .150	780	2.25
DE-2	.055 x .015	.100 x .150	780	2.25
DE-3	.060 x .015	.100 x .100	780	2.25
DE-4	.062 x .015	.100 x .150	780	2.25
DE-5	.080 x .031	.200 x .300	200	2.25
DE-6	.093 x .031	.200 x .300	200	2.25
DE-7	.100 x .031	.200 x .300	200	2.25
DE-8	.110 x .031	.200 x .300	200	2.25
DE-9	.125 x .025	.200 x .300	200	2.25
DE-10	.150 x .031	.200 x .300	200	2.25
DE-11	.187 x .031	.250 x .250	180	2.25
DE-12	.200 x .031	.312 x .280	156	2.25
DE-13	.218 x .031	.312 x .280	130	2.25
DE-14	.250 x .031	.400 x .400	80	2.25

DIP UNIVERSAL PATTERNS

A universal pattern can be used to make an entire family of component footprints. For example, the DE-16 may be used to make any DIP from 8 to 64 pins with or without traces by simply burnishing down the desired number of pads and traces from the appropriately spaced set of columns.

NO.	PHOTO	DESCRIPTION	PRICE
DE-15	 contains 542	.125" x .070" cut pad with Pin 1 I.D.	2.25
DE-16	 contains 332	.125" x .070" cut pad with trace & pin 1 I.D. Packages	2.25
DE-17	 contains 332	.100" x .055" ellipse with trace & pin 1 I.D.	2.25
DE-18	 contains 332	.125" x .050" oval with trace & pin 1 I.D.	2.25
DE-19	 contains 332	.100" x .050" oval with trace & pin 1 I.D.	2.25

CARD EDGE FINGERS



If these fingers are too long for your circuit, they may be cut BEFORE burnishing to desired length.

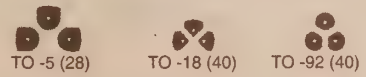
PART NO.	DESCRIPTION		PRICE
DE-54	.080" width on .156" centers	(50 fingers)	2.25
DE-54B	.060" width on .125" centers	(62 fingers)	2.25
DE-55	.050" width on .100" centers	(156 fingers)	2.25

STRAIGHT LINE CONNECTORS

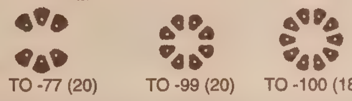
All lines are approx. 3.75" long. A ball burnisher is recommended. Best results when the line is cut while still on carrier sheet.

PART NO.	LINE WIDTH		LINES/ PACK	PRICE
DE-59	.014"	—	32	2.25
DE-60	.021"	—	32	2.25
DE-61	.026"	—	32	2.25
DE-62	.031"	—	32	2.25
DE-63	.040"	—	28	2.25
DE-64	.050"	—	24	2.25
DE-65	.063"	—	22	2.25
DE-66	.080"	—	20	2.25
DE-67	.092"	—	18	2.25
DE-68	.100"	—	16	2.25
DE-69	.125"	—	14	2.25

"TO" PACKAGES



DE-57 .... **$2.25**



DE-58 .... **$2.25**

"D" SUBMINI CONNECTORS

Use the DB-15 foot to make the DB-9, spacing is the same.

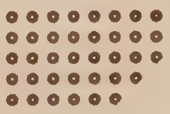
PART NO.	DESCRIPTION	PRICE
DE-51	Pattern for DB-15 & DB-25 (12 each)	2.25
DE-52	Pattern for DB-17 (8) & DB-50 (6)	2.25

DIN - 41612 CONNECTORS

The German DIN standard is used commerically in Europe and in NATO equipment. For high voltage, every other pin is used.

PART NO.	DESCRIPTION	PRICE
DE-3	.060" round pads on .100" centers (4)	2.25
DE-53	.055" square pads on .100" centers (2)	2.25
DE-83	.060" square pads on .100" centers (2)	2.25

UNIVERSAL PIN GRID ARRAYS



Arrays are donut pads in 18 x 18 donut arrays on .100" centers. These may be cut BEFORE burnishing to desired size or simply burnish only the donuts needed.

PART NO.	DESCRIPTION	PRICE
DE-49	.062 x .015" donuts (4 sets)	2.25
DE-50	.050 x .015" donuts (4 sets)	2.25

DATAK PC DRAFTING PATTERNS DATAK

PRINTED CIRCUIT TAPES

These precision tapes are used throughout the industry for creating conductors between component pads on PC artwork. They may be used either for orginal PC art or on the copper surface itself to act as an etch resist when making prototypes. The tape is made of crepe .005" thick with and adhesive back. The crepe is a flexible material and corners can be followed after developing a bit of skill. Black is the standard color. Many widths are available for various current conductors or for use in 2x or 4x scale artwork. DATAK tapes are twice as long as other brands. 720" length.

PART NO.	THICKNESS	PRICE
PC-1	▬ .015"	1.90
PC-2	▬ .020"	1.90
PC-4	▬ .031"	1.90
PC-5	▬ .040"	1.90
PC-6	▬ .050"	2.00
PC-7	▬ .062"	2.20
PC-8	▬ .080"	2.50
PC-10	▬ .100"	2.50
PC-11	▬ .125"	2.90
PC-12	▬ .150"	3.85
PC-15	▬ .250"	3.85
PC-16	▬ .300"	3.85

DONUT PADS

This JotDraft series consists of a very wide selection of pre-spaced Donut Pads for use in PC artworks. All products on this page are Dry-Transfers,that is to be rubbed down on your drawings with a burnishing tool. These rugged pads may also be used as direct etch resist patterns in that they may be directly to the copper surface for use as an etch resist. You may rub-down one pad or a long series of pads for mutiple-leaded components.Use Datak tapes for interconnections. Note: Pads are black and have a precise inside hole listed.

●	(O.D. .062" ID .015") QTY/set 7776 **JDS-510** **$5.95**
●	(O.D. .100" ID .030") QTY/set 2592 **JDS-506** **$5.95**
●	(O.D. .124" ID .030") QTY/set 2592 **JDS-509** **$5.95**
●	(O.D. .187" ID .031") QTY/set 4608 **JDS-137** **$9.95**
●	(O.D. .240" ID .060") QTY/set 640 **JDS-602** **$5.95**
●	(O.D. .300" ID .031") QTY/set 1920 **JDS-342** **$9.95**

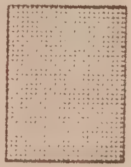
COPY CLEAR SHEETS

For use in laser printers and most dry toner copy machines to make film positives. Great for copying circuits from magazine or printing out circuits designed on PC DATAK 12-077 Software (pg. 53)

Pkg. of 5 sheets
(8 1/2" x 11")

12-500 .... $3.80

1/10" GRID SHEETS



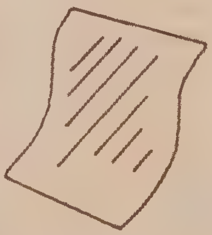
1/10" Grid Sheets printed in non-repro blue. Perfect for circuit layout when used under DATAK clear layout film. (No. MS-21)

Pkg. of 3 sheets
(8 1/2" x 11")

12-505 .... $1.20

DRAFTING FILM FOR PC ARTWORK

A translucent polyester film for use as a carrier film on which drafting symbols can be placed to make original artwork. One side is a matte finish to accept pencil or ink.



8 1/2" x 11" sheets.

2 sheets per package

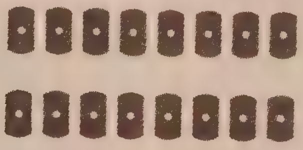
MS-21 .... $2.50

JOTDRAFT™ 14 THROUGH 40 PIN DUAL INLINE PATTERNS (DIP)

These patterns all use a tough, clear "JD carrier film" that lets you transfer the entire pattern by merely rubbing along one edge with a burnishing tool (cat #04158, spoon type or #04159, ball type). Good results are also achieved on the smaller patterns with a ball point pen.

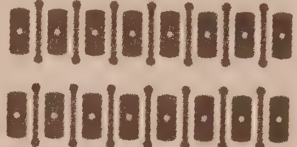
To reduce a pattern pin count, transfer a longer pattern in place, lightly score the JD carrier film with drafting knife, and peel away the extra pads. Please note: the carrier film prevents these patterns from being used as DIRECT ETCH™ resist.

LARGE AREA CUT PAD, Pin 1 Identifier
Dims:.125" Dia. x .070" with .020" hole.



NO. OF LEADS	SPACING L" x W"	NO. OF PATTERNS	SCALE	CAT. NO.	PRICE
14	.100 x .300 CENTERS	168 432	2x 1x	JD-67 JD-68	9.95 9.95
16	.100 x .300 CENTERS	168 384	2x 1x	JD-64 JD-65	9.95 9.95
20	.100 x .300 CENTERS	144 336	2x 1x	JD-575 JD-576	9.95 9.95
24	.100 x .300 CENTERS	108 288	2x 1x	JD-394 JD-395	9.95 9.95
24	.100 x .600 CENTERS	24 64	2x 1x	JDS-396 JDS-397	9.95 9.95
28	.100 x .600 CENTERS	72 192	2x 1x	JDS-398 JDS-399	9.95 9.95
40	.100 x .600 CENTERS	16 48	2x 1x	JDS-400 JDS-401	9.95 9.95

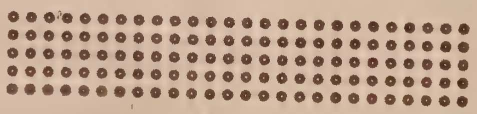
NARROW CUT PAD, .015" TRACE, Pin 1 Identifier
Dims:.125" Dia. x .053" with .015" hole.

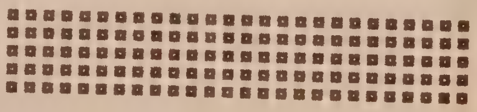


NO. OF LEADS	SPACING L" x W"	NO. OF PATTERNS	SCALE	CAT. NO.	PRICE
14	.100 x .300 CENTERS	168 480	2x 1x	JD-182 JD-183	9.95 9.95
16	.100 x .300 CENTERS	168 432	2x 1x	JD-179 JD-180	9.95 9.95
20	.100 x .300 CENTERS	144 336	2x 1x	JD-585 JD-586	9.95 9.95
24	.100 x .300 CENTERS	108 288	2x 1x	JD-587 JD-588	9.95 9.95
24	.100 x .600 CENTERS	24 64	2x 1x	JD-589 JD-590	9.95 9.95
28	.100 x .600 CENTERS	66 192	2x 1x	JD-591 JD-592	9.95 9.95
40	.100 x .600 CENTERS	16 48	2x 1x	JDS-593 JDS-594	9.95 9.95

DIN 41612 UNIVERSAL SPACED PADS

These universal patterns let you "build" any DIN pin pattern from 16 to 96 pins, just by rubbing down the appropriate pad rows. All patterns are 32 by 5 pads on .100" centers. 1x patterns work as DIRECT ETCH™ resist.



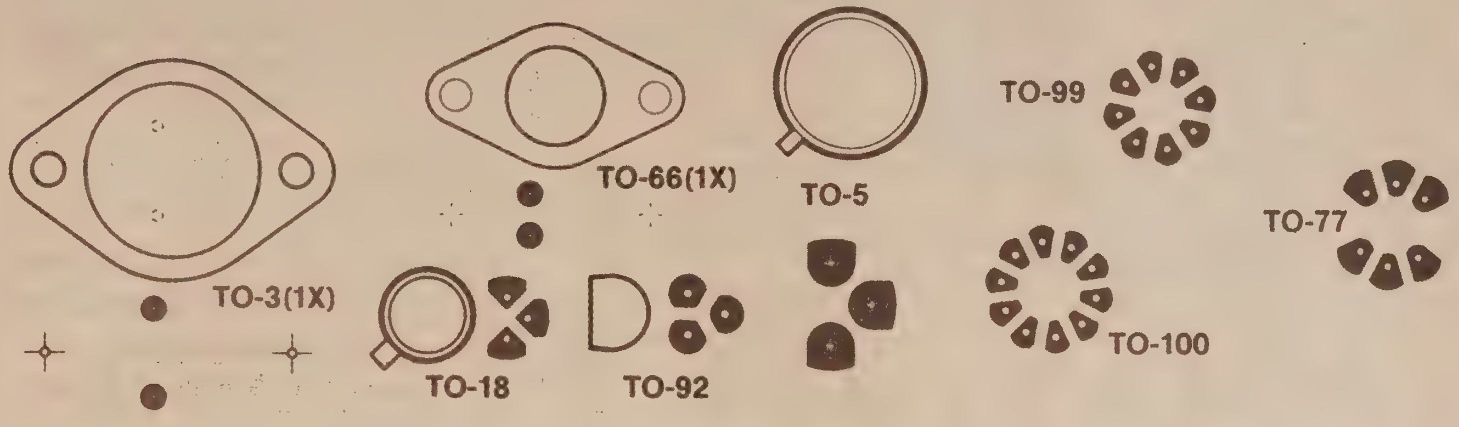


PART NO.	PAD DIMS.	NO. OF PATTERNS	SCALE	PRICE
JD-557 JD-558	.060"OD X .015"ID	24 96	2X 1X	9.95 9.95
JD-569 JD-570	.060"SQ X .015"ID	24 96	2X 1X	9.95 9.95

DATAK PC DRAFTING PATTERNS DATAK

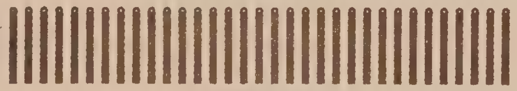
JOTDRAFT™ PAD PATTERNS, PACKAGE OUTLINES, DIP TERMINAL MARKERS

These patterns can be lifted and repositioned. All illustrations are 2 times scale unless otherwise specified.



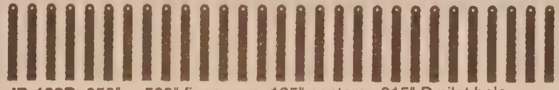
STYLE	SCALE	NO. OF PATTERNS	CAT. NO.	PRICE	STYLE	SCALE	NO. OF PATTERNS	CAT. NO.	PRICE	STYLE	SCALE	NO. OF PATTERNS	CAT. NO.	PRICE
TO-3	2x	18	JDS-53	5.95	TO-3	2x	32	JDS-108	5.95	TO-3	2x	144	JDS-76	5.95
OUTLINE	1X	48	JDS-54	5.95	PAD PTRN.	1X	104	JDS-109	5.95	PAD PTRN.	1X	312	JDS-77	5.95
TO-66	2x	24	JDS-56	5.95	TO-5	2x	144	JDS-82	5.95	TO-66	2x	264	JDS-91	5.95
OUTLINE	1X	80	JDS-57	5.95	PAD PTRN.	1X	336	JDS-83	5.95	PAD PTRN.	1X	608	JDS-92	5.95
TO-5	2x	88	JDS-24	5.95	TO-18	2x	288	JDS-88	5.95	TO-5	2x	144	JDS-70	5.95
OUTLINE	1X	33	JDS-25	5.95	PAD PTRN.	1X	608	JDS-89	5.95	PAD PTRN.	1X	384	JDS-71	5.95
TO-18	2x	192	JDS-30	5.95	TO-66	2x	64	JDS-111	5.95	TO-18	2x	120	JDS-73	5.95
OUTLINE	1X	60	JDS-31	5.95	PAD PTRN.	1X	104	JDS-112	5.95	PAD PTRN.	1X	384	JDS-74	5.95
TO-92	2x	408	JDS-36	5.95										
OUTLINE	1X	704	JDS-37	5.95										

EDGE CARD CONNECTOR FINGERS

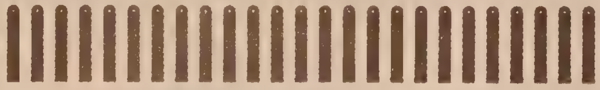


JD-168

.060" x .500" fingers on .100" centers. .015" D pilot hole.



JD-122B .050" x .500" fingers on .125" centers. .015" D pilot hole.



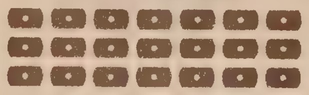
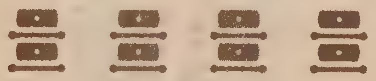
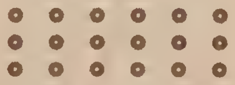
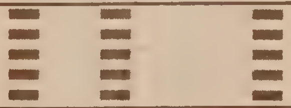
JD-122 .080" x .500" fingers on .156" centers. .015" D pilot hole.

These universal fingers rub down separately, so 1X patterns work as DIRECT ETCH™ resist. The extra length is for connecting to a plating bar. To shorten a finger, 1) cut lightly with a knife (cat # 12161). 2) apply "Scotch" or other brand cellophane tape to the cut section. 3) remove the tape along with the surplus.

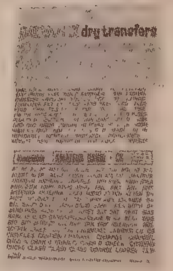
CTR. TO CTR. SPACING	NO. OF FINGERS	SCALE	CAT. NO.	PRICE
.156"	624	2X	JD-121	10.65
.156"	1224	1X	JD-122	10.65
.125"	792	2X	JD-166	10.65
.125"	1488	1X	JD-122B	10.65
.100"	984	2X	JD-123	10.65
.100"	3888	1X	JD-168	10.65

DOTDRAFT™ UNIVERAL PATTERNS

These Dry-Transfer patterns may be transferred Pad-by-Pad, allowing you to "build" any pattern that has .100" pin spacing and .300" between pin rows (i.e. any I.C. etc.) all without measuring. The 1X patterns may be used either in artwork or as direct etch resist on copper.

	DESCRIPTION	QTY/SET	SCALE	CAT. NO.	PRICE
	.125"D x .070" cut pad with .020" hole on .100" x 150" precision centers Includes pin 1 Identifiers.	4920 11520	2x 1x	JD-170 JD-171	10.65 10.65
	.125"D x .053" cut pad with .015" hole on .015" trace on .100" x .300" precision centers with pin 1 identifiers.	2460 7968	2x 1x	JD-173 JD-174	10.65 10.65
	.055" x .015" donuts on .100" x .150" precision centers.	5760 21120	2x 1x	JD-338 JD-334	10.65 10.65
	.025" x .075" rectangular pads on .050" x .225" and .375" precision centers. For "SO" packages.	2040 6192	2x 1x	JDS-515 JDS-516	10.65 10.65

DATA MARK™ DRY TRANSFER TITLES & LABEL SETS



The DATAMARK™ Dry Transfer (Rub-Down) series is economical because the sets are selective to keep them small; each set covers titles used in a specific segment of electronics. Small alpha/numeric sets are also listed in this series. The various electronic titles contain five sheets of titles plus one alpha/numeric characters sheet (sheet size: 3.25" x 5"). The alpha sets contain six sheets of both letters and numbers in an assortment of black, white and gold characters. DATAMARK™ series characters should be protected with DATAKOAT or HARDKOAT protective coatings when used on panels or chassis. DATAK's classic sharpness and high quality look is assured throughout.

ELECTRONICS TITLE TYPE	DESCRIPTION	PART NO. BLACK	PART NO. WHITE	PRICE
AUDIO, TV & HI-FI	Titles cover the audio, recording and stereo areas	K58B	K58W	4.95
AMATEUR RADIO	For all RF and communications	K59B	K59W	4.95
HAM RADIO	UPDATED with latest terms and titles	K70B	K70W	4.95
HOME THEATRE	All titles needed for complete Home Theatre Installation	K72B	K72W	4.95
PERSONAL COMPUTER	Titles cover all computer applications, hook-ups and installations	K74B	K74W	4.95
EXPERIMENTER HOME & INTERCOM	terms like "attic fan", "laundry", or "RESET" & "ADJUST"	K60B	K60W	4.95
TEST & INDUSTRIAL	for marking scopes, plotters etc. and industrial system panels	K61B	K61W	4.95
MARKS & SWITCH PATTERNS	Arrows, lines, graduations and rotary switch patterns	K62 includes both white & black		4.95

Alphabet and Numeral sets

Contains (3) black, (2) white and (1) gold sheet of letters and numerals:

K63	1/8" LETTERS AND NUMERALS	**$4.95**
K64	1/4" LETTERS AND NUMERALS	**$4.95**
K65	1/2" LETTERS AND NUMERALS	**$4.95**

COMPONENT DESIGNATION SETS

(Letters & Numerals) (Industry standard size, rub-down type)

Used for component identification on PC boards or terminal and chassis markings. This is a set of 24 sheets (3.5" x 5") of rub-down letters, letters combination and numerals as follows:

12 sheets of letters and letter combinations
11 sheets of numerals 1 through 20 and 1 thru 227
1 sheet of numerals 0 through 9

Designations conform to accepted standards such as ANSI Y3202 and IEEE STD 315. 12 point (1/8") News Gothic typeface.

Professional Title sets in Datak's Jotdraft designation sets. This series should be protected with DATAKOAT liquid No. 04176. No. 04158 (pg. 77) burnishing tool is suggested; ball point pen may be used.

Great for rebuilding old radio dial faces or remarking old style panel meters.

9661	**BLACK**	**$11.95**
9671	**WHITE**	**$11.95**

TITLES for Electronic Equipment

Each set contains over 2200 rub-down titles and labels for electronic panels, name plates etc. ... Razor-sharp letters make prototypes look clean and professional; provide excellent detail when used on drawings or PC board artwork. Frequently used titles and designations appear several times. The title selection is kept current via user polls. In addition to titles, both sets also contain a generous supply of alpha and numeric characters for creating special titles. The 10 point size is about 0.105" high and we recommend for miniature panels. The 12 point letters are about 0.125" high. We recommend protective coating of the applied titles with DATAKOAT liquid No. 04176 on circuit boards and panels. On paper or vellum, use HARDKOAT matte No. 04171 or gloss No. 04170.

ET948	**10 POINT TITLES BLACK**	**$11.95**
ET949	**10 POINT TITLES WHITE**	**$11.95**
ET9581	**12 POINT TITLES BLACK**	**$11.95**
ET9591	**12 POINT TITLES WHITE**	**$11.95**

PROTECTIVE COATING FOR DRY TRANSFERS

All dry transfers have limited resistance to abrasion and handling; they should be given a protective coating. A great deal of development has gone into creating Datak's protective coatings, which we believe to be the best that you can use on any brand of transfers. See below to be sure that you select the correct type of coating for your application.

DATAKOAT™ for Hard Surfaces

Protects dry transfers with a tough, clear, weatherproof shield. Waterclear and will not yellow with age. Available in either gloss or matte: use gloss for a mirror smooth surface or matte for a lustrous, satiny finish. For use on hard surfaces as enamels, plastics, metal, etc. ...
DATAKOAT spray dries tack-free within a few minutes, but requires several days to fully harden. Baking will accelerate the process, see the package label for details.
RESISTANCE: unaffected by methanol, ethanol, isopropanol, hexane, naptha and minerals spirits. Unaffected by most lubricating oils and hydraulic fluids. But soluble in; Freon, methylene chloride, butanol, higher alcohols, acetone, ketones, toluene, xylene and glycol ethers.
DATAKOAT is also supplied in a brush-on package for local application to dry transfers. The dried brush-on leaves a shiny coating; use the sprays if this is objectionable.

04176	**DATAKOAT brush-on liquid w/thinner (1 oz.)**	**$3.75**
04177	**DATAKOAT, gloss spray (12 oz.)**	**$6.30**
04178	**DATAKOAT, matte spray (12 oz.)**	**$6.30**

HARDKOAT™ for Paper or Cardboard ...

clear sprays protect dry transfers on absorbent surfaces such as paper. Abrasion resistance is superior to DATAKOAT, but resistance to weathering and UV is not as good.

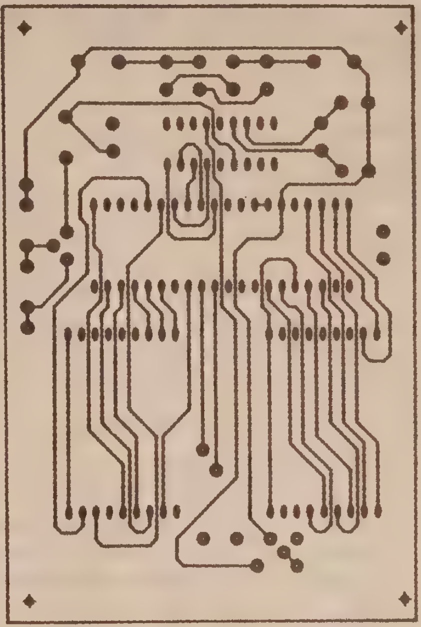
One coat over paper will completely protect a dry transfer from scuffing and abrasion. Matte coats give a pleasing frosted effect. Heavy multiple spray coats may have a perceptible yellowish tint, so use DATAKOAT where an absolutely water-clear coat is essential. HARDKOAT films dry tack-free within a few minutes, but require several days to fully harden.

When coating a large area, the gloss spray can produce a pleasing, somewhat shiny appearance. If using on local area, the matte finish tends to be less visible.

04170	**HARDKOAT gloss spray (12 oz.)**	**$6.30**
04171	**HARDKOAT matte spray (12 oz.)**	**$6.30**

SOFTWARE FOR MAKING PRINTED CIRCUIT BOARDS

NEW! PCDATAK™ SOFTWARE FOR MAKING PRINTED CIRCUIT BOARDS ON ANY WINDOWS 95 OR MS-DOS IBM COMPATIBLE PC!



- Make single or double sided PC Board artwork, up to 30" x 30".
- Print your artwork on any PostScript™ Laser Printer.
- Produces a 1X positive, ready to use with precoated board. No other artwork required.
- Produce industry standard solder mask and component layout for silkscreen art.

PCDATAK™ is supplied on one 3.5" diskette with a quick start manual. The full user's manual is larger and must be printed by the user (dot matrix printer ok): approximately 75 pages in length.

The ***NEW* PCDATAK™** software lets you create PC boards ranging from prototypes to hobby projects, and on a par with the pro's. You may do the complete printed circuit board layout artwork on your own PC; at a fraction of the cost of other programs. Print the layout on any PostScript™ compatible printer, either on regular paper to be photographed for a positive or negative, or on clear film to be used directly as a positive with other Datak products.
PCDATAK™ will produce soldering pads for all standard components, including the latest in surface mount products. Custom "features" (components) may be designed easily, when needed. User selectable pads and connecting trace widths let you do any circuit that you can imagine.

The ***NEW* PCDATAK™** software from DATAK may be used on any MS-DOS, IBM compatible personal computer with a system minimum of: a hard drive, 2 megabyte free drive space, 640K RAM, a high density 3.5" diskette drive and a mouse is recommended. Printing does require a PostScript™ printer which can often be found at a local copy center if you do not have your own.

What is PCDATAK™? The PCDATAK program is a CAD system for designing and producing printed circuit boards. It allows the user to make his schematic circuit into a printed circuit layout file and to use that file to print PC board artwork that is used to produce a finished PC board, solder masks and component side I.D. silk screens.

Who uses PCDATAK™? The software has been designed for use by nearly anyone wanting to make a PC board, either in quantity or in prototype lots, at a software cost low enough for nearly anyone's pocket. Additionally, PCDATAK™ software may be used to create a circuit that can be produced, from your disk file, by a professional PC board manufacturing company: International Design Modeling of Bedford, NH (particulars are in the introduction in the enclosed manual). This may be of special interest to users needing either large quantities or prototyping very complex boards.

What can PCDATAK™ do? The software can produce either a single sided or double sided PC board up to 30" x 30" in size. Industry accepted component pad and trace sizes are preset or the user may also customize the software for any desired components. Component identification silkscreen art and solder mask art are also produced.

How do I print the Circuit? PCDATAK™ circuits may be printed (or copied on a copy machine) directly onto a clear carrier sheet, such as those made for overhead projectors, and then used as a 1:1 "positive" in making a PC board. A Postscript™ compatible laser printer may be used; ordinary dot matrix and ink jet printers will not work. If you do not have a PostScript™ printer, call your local copy centers where you can very likely take your circuit on a disk and print it for a moderate fee.

PCDATAK™ system requirements: Nearly any IBM-PC or compatible with a minimum of 640K on board memory may be used. A hard disk is mandatory as is a 3.5" disk drive. A mouse will make the job much easier and is strongly recommended.

Note: PCDATAK™ is not shareware or freeware in any sense. The user is entitled to use one copy at a time may not duplicate the software except for his own personal use and for backup purposes. Copies made for any other purpose are unauthorized and illegal.

12-077 Software with QuickStart Manual $29.95

Visit our website www.oselectronics.com for a large selection of PCB CAD Software

DATAK PHOTOETCH PRINTED CIRCUIT KIT DATAK

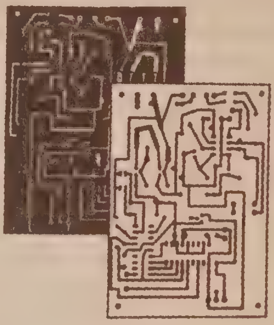
NEW! NEG-FAST FILM — MAKE PCB'S FROM A MAGAZINE OR YOUR ART!

Datak® presents: a NEGATIVE ACTING FILM for __Easier__ Printed Circuit Board Making. Now you can quickly create a negative from a magazine positive or from your CAD program's positive. Why create a negative? So that you may use Datak Negative Acting Liquid Photo Resist; the most flexible and economical way to make a high-quality PC board.

Creating a negative of your Printed Circuit, positive artwork was once a serious chore; and hit or miss at best! Now we offer a film that eliminates several steps and is totally dependable. Perfect images every time! Finally, you can enjoy the freedom and economy of spraying your own PC boards with our high precision, negative-acting photo resist. You can spray boards of any size, any shape. Save money, time; and you can cut, size and shape your PC boards before coating and exposing.

Using new **Neg-Fast©** Film:

1. To produce a negative from a magazine article, you may either cut the magazine PC board pattern from the magazine or make a copier photocopy of it. Place the PC board pattern on top of the fill in a Contact Exposure Frame and expose to U/V light; Datak no. ER-39 bulb is recommended. Exposure time is about four minutes.
2. To produce a negative from your (black on transparent) positive, in an Exposure Frame, place the positive on top of the film and expose for 1 1/2 minutes.
3. After either step one or two above, develop the film according to instructions in the Datak developer (no. 12-710). Then you are ready to use Datak Negative Photo Resist, which is sprayed on your PC board with the pump-sprayer included. Use Datak ER-8 developer after the resist is exposed to the ER-2000 bulb.

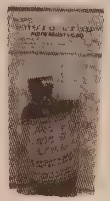


Positive (foreground) become a negitive (behind)

Neg-Fast© Film is available in:

Catalog no. 12-720 is a package of six **Neg-Fast©** 5" x 6" sheets.	**$7.38**
Catalog no. 12-730 is a package of two **Neg-Fast©** 11" x 8" sheets.	**$7.38**
Catalog no. 12-710 is a developers package containing 4 oz. Each of developer and fixer concentrates.	**$5.90**
Catalog no. 12-740 is a complete **Neg-Fast©** film and developers kit of four 5" x 6" sheets of **Neg-Fast©** film plus the developer and fixer concentrates	**$11.75**
Catalog no. 12-750 is a comprehensive PC Board making kit including exposure frame, film, photoresist, developers for both film and resist, 5" x 6" and 3" x 4 1/2" copper clad board, dry transfer PC patterns, PC tape, clear drafting film, 1/4 pound anhydrous ferric chloride etchant, and complete instruction manual.	**$39.95**

NEGATIVE ACTING RESIST



is a pump-spray photo resist for use on copper PC boards. The 4 oz. bottle will sensitize approx. 1700 square inches of PC board.

ER-71 .... $7.95

DATAK SYSTEMS INSTRUCTIONALS MANUAL

A manual that gives detailed instructions for most DATAK PC board making products including: **Neg-Fast© film,** Negative Photo Resist, Presensitized PC Boards, Tinnit™ Tin Plating and Etching. A complete guide for PC board making via DATAK products.

12-760 .... $1.50

PHOTO ETCH
DEVELOPER

NEGATIVE RESIST DEVELOPER

is a solvent based developer that will remove the resist from areas not hardened by the U/V light. This 8 oz. package will develop hundreds of square inches of board, dependent upon such factors as area coverage and thickness of the coat.

ER-8 .... $5.40

EXPOSURE BULB

UV source for DATAK **Neg-Fast©** film, Presensitized PC Boards, and Negative Acting Photoresist.

ER-2000 .... $11.95

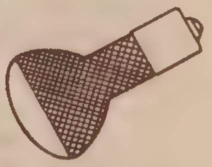
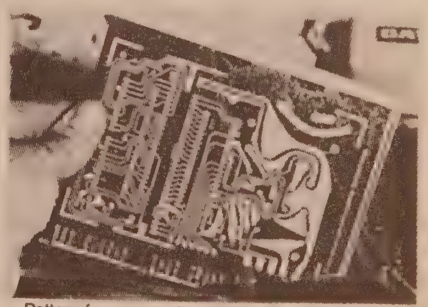


PHOTO-ETCH™ PRINTED CIRCUIT KIT

This complete kit can be used to "lift" a PC circuit right out of magazine articles. The **Neg-Fast©** film will produce a negative of the circuit, which can then be used with the DATAK negative acting photoresist. You will need to purchase the DATAK no ER2000 Light bulb unless you already have the necessary UV light source. Included in this kit are: Exposure Frame, Neg-Fast Film, Film Developers, Negative Acting Photoresist, Resist developer, Resist Tapes and Patterns, Etchant, and complete instructions. Developing trays are not included (see instructions).

This is a process that does require some ability to deal with a detailed process and is not recommended for youngsters.

12-750 .... $39.95



Pattern from magazine that is nearly done etching.

DATAK PRINTED CIRCUIT BOARD SUPPLIES DATAK

DIRECT ETCH™ PRINTED CIRCUIT KIT

MAKE PRINTED CIRCUIT BOARDS WITH NO ARTWORK!

DIRECT ETCH
Dry Transfer Printed Circuit Etch Kit
DIRECT ETCH Printed Circuit Etch Kit

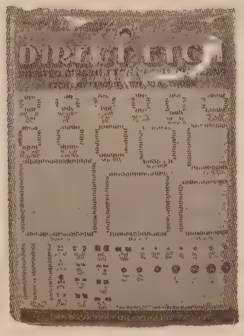
You "wire" the actual circuit by rubbing down dry transfer etch resist patterns right on a copper clad board. Connect patterns with dry transfer lines or etch resist tape, etch in a ferric chloride solution and in a few minutes, the finished copper circuit can be drilled and loaded with components.

What makes this possible is the dry transfer resist material. It's a special plastic ink that's unaffected by aqueous etchants and most industrial solvents. Etch resolution is superb. Resist lines down to 0.015" etch cleanly with about 0.001" total undercut in a still etch bath; even better results are achieved in a spray etch tank. This includes edge card connectors, precision spaced donuts, and continuous SOT, SOIC and DIP patterns. Use some or all of them to fabricate complete, one-of-a-kind designs with ease.

The DIRECT ETCH set includes a huge assortment of resist patterns: universal DIP's, assorted size donuts, transistors, round can ICs, dry transfer lines, resist tape complete instructions. Materials are packed in a plastic storage box that doubles as an etch tray.

ER-1 .... $10.95

DIRECT ETCH MASTER ASSORTMENT



If you get involved with high tech circuits, you'll need resist patterns for DIP's, quad packe, SO packs, "D" and DIN connections, 1/64" to 1/4" traces, every size donuts from .050" up, and others you never thought you'd need but suddenly do. Be safe. Get the DE973 FULL RANGE MASTER ASSORTMENT. Contains 69 different resist pattern sheets that cover every component you can dream up — and a few you haven't! Good for 1X artwork too.

DE-973 .... $24.95

DIRECT ETCH ECONOMY KIT

The ER-2 is a kit containing 8 sheets and 2 rolls of drafting tape, 1/16" and 1/32" widths. The patterns are a fairly good sampling that will be needed for most small circuits using common components such as IC's, resistors, transistors etc. Very economical.

ER-2 .... $7.95

DIRECT ETCH REPLACEMENT KITS

ASSORTED DONUTS PADS

The most needed Direct Etch pattern, this kit contains a wide range of donuts on four DE-series sheets.

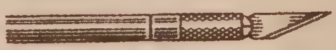
ER-13 .... $3.89

DIP, FLATPACK and SO PADS

This is a four sheet assortment of the most needed IC pads for DIP's and more. The larger dips can be used in part to make smaller size; i.e. 14 may be used to make an eight etc . . .

ER-14 .... $3.89

DRAFTING KNIFE



A standard No. 1 modeler's knife, indispensable for drafting and printed circuit design; includes five assorted blades.

12161	**#1 KNIFE**	**$3.22**
12182	**BLADE REFILLS 5/PK**	**$1.59**

DIRECT ETCH™ RESIST PENS

These pens are filled with lacquer ink that is resistant against aqueous PC etch solutions. Ideal for photo resist patterns touch-up or for direct-etched boards with tight spaces. Board must be clean for best results. Available in 2 size widths.

ER-15	**FINE POINT**	**$1.80**
ER-25	**EXTRA FINE POINT**	**$1.95**

DRY CONCENTRATED ETCHANT

(FERRIC CHOLRIDE)

Ferric Chloride is the best choice for etching copper PC boards. Datak supplies FeCl in a dry, powder form and the user must add it to water to make the etching solution. The 1/4 lb. package produces 1 pint which will etch approx. 200 sq. inches of standard copper board.

ER-3	**1/4 lb. ETCHANT POWDER**	**$3.95**
ER-21	**1 lb. ETCHANT POWDER**	**$7.39**
ER-22	**2 lb. ETCHANT POWDER**	**$12.59**

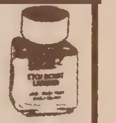
TINIT™ TIN PLATE

Tinnit™ will plate a copper clad board with a bright tin plate approx. .0004" thick. Enhances solderability, resists oxidation. Also use on card edge contact fingers. Supplied as a dry concentrate; just add water. One pint plates up to 600 sq. inches of copper. May be used to plate some other metals such as brass, bronze, iron; anything more active than tin.

Plating is complete in about 10 minutes in a fresh solution. TINNIT™ is supplied as a dry mixture with indefinite shelf life. When mixed with water, the solution has approximately a 2 month life.

ER-18	**1 PINT SIZE**	**$4.95**
ER-181	**1/2 GALLON SIZE**	**$14.95**

ETCH RESIST LACQUER



Fast drying, easy to apply resist circuit pattern on PC boards. Also used to "touch-up" or modify photo resist patterns before etching. Bottle is supplied with small brush attached to cap.

22-244 .... (BOTTLE 1/2 FL. OZ.) $7.95

STRIPPING SOLUTION

Removes remaining etch resist from PC boards. Removes any coating that remains over the copper after etching which may interfere with the soldering of the component leads to the PC board.

22-240 .... (BOTTLE 2 FL. OZ. 59 ML) $5.95

BURNISHING TOOLS

04158
04159

A quality stylus burnisher will give you a better, easier job with dry transfers than using a ball point pen. Polished metal tips provide even transfer, even if you use too much pressure.

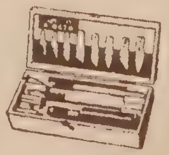
STANDARD TOOL, for characters and lines from .080" up to 1/4". The other end is a 3/8" felt, flexible burnisher.

04158 .... $4.29

SPOON TIP burnisher tool with tip suitable for transfers 1/4" and larger. Other end a 3/8" felt, flexible burnisher.

04159 .... $4.75

PRECISION KNIFE SET



This kit is a must for hobbyist or anyone working with PC artwork. Very handy for many uses in the shop.

Set Includes:

- 3 Knife Handle
- 1 Blade Holder
- 10 Assorted Blades
- Durable Solid Case for easy storing

10250 .... $13.95

PRINTED CIRCUIT BOARD SUPPLIES

COPPER CLAD PC BOARDS

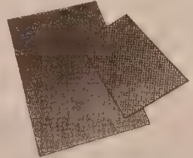
Standard Copper Boards made of 1 oz. copper (.0014") on base of FR-4 reinforced fiberglass.

SINGLE SIDED		
22-204	2" x 4"	$1.45
22-250	3" x 5"	1.95
22-260	4" x 6"	2.60
22-261	6" x 6"	3.40
22-263	6" x 9"	4.90
22-264	8" x 10"	6.25
22-212	12" x 12"	10.35

DOUBLE SIDED		
22-265	4" x 6"	3.20
22-266	6" x 6"	3.50
22-267	6" x 9"	4.90
22-810	8" x 10"	6.95

POSITIVE PRE-SENSITIZED PC BOARDS

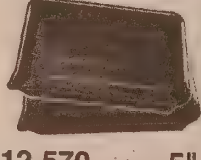
Made of 1/16" thick glass epoxy base with one ounce (0.0014") copper. Coated with POSITIVE etch resist photo sensitizer. Use with Developer, Cat. No: 12-402, 12-406. Base is FR-4 (G-10) Fiberglass.



SINGLE SIDED		
14-024	2" x 4"	$3.10
14-034	3" x 4"	3.50
14-036	3" x 6"	3.85
14-046	4" x 6"	4.60
14-066	6" x 6"	5.53
14-069	6" x 9"	7.70
14-071	7" x 10"	9.70
14-112	12" x 12"	18.25

DOUBLE SIDED		
14-234	3" x 4"	$3.65
14-266	6" x 6"	7.25
14-269	6" x 9"	9.90
14-312	12" x 12"	22.80

DEVELOPING & ETCHING TRAYS



Plastic trays are for etching with Ferric Chloride solution or for positive developing. Made of high grade black plastic.

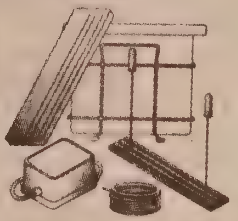
12-570	5" x 7"	$4.80
12-515	6" x 8"	$8.25
12-810	8" x 10"	$8.95
12-114	11" x 14"	$10.95

DRY CONCENTRATE ETCHANT (FERRIC CHOLRIDE)

Ferric Chloride is the best choice for etching copper PC boards. Datak supplies FeCL in a dry, powder form and the user must add it to water to make the etching solution. The 1/4 lb. package produces 1 pint which will etch approx. 200 sq. inches of standard copper board.

ER-3	1/4 LB. ETCHANT POWDER	$3.95
ER-21	1 LB. ETCHANT POWDER	$7.39
ER-22	2 LB. ETCHANT POWDER	$12.59

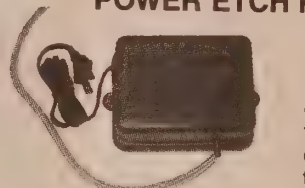
PROFESSIONAL PC BOARD POWER ETCHING SYSTEM



A semi-automatic etching device for use in labs, schools, prototype shops and for limited PC board production. Reduces etching time to minutes. Air pump agitates etching solution for fast, very even etches. Handles up to two 8" x 9" PC boards at a time. either single or double sided. The system is supplied with air pump, heater for keeping etchant at optimum temperature and convenient board holder.

12-700 .... $34.95

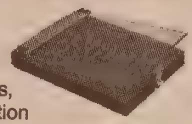
POWER ETCH PUMP



The etch pump and distributor tubing may be used to accelerate etching and free you from some of the constant agitating of the etch solution. Bubbles provide both agitation and also some oxygen which inhances the process.

ER-12 .... $9.95

CONTACT EXPOSURE FRAMES



A contact frame is needed to hold film and PC Boards during the exposure. Spring Loaded, Steel Frame comes complete with glass, backboard, and complete instruction manual.

ER-10	9" x 12"	$18.35
ER-56	5" x 6"	$9.85

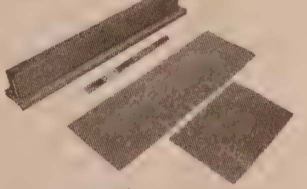
CIRCUIT-FIX ™ PC BOARD TRACE MAKER

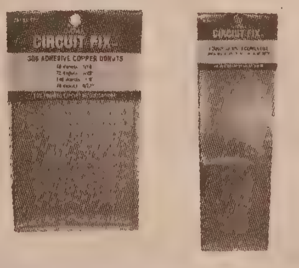
The CIRCUIT-FIX system has been designed to allow you to cut accurate, burr-free copper foil traces for PC boards for the purpose of adding to or repairing a circuit board. CIRCUIT-FIX is a handy system wheather for prototype modifications or for circuit repairs.

The system centers on a spring loaded clamp and cutting guide that permits excellent trace cutting with a modeling knife. Both the knife a sheet of self adhesive copper trace material are included. Also included is a sheet of (assorted sizes) pure copper adhesive donut pads. The cut trace and donuts are burnished to the board and the soldered to component leads.

CIRCUIT-FIX SYSTEM complete - No. CF-1
Copper Donut refills (308 pcs. assorted) - No. CF-2
Copper Foil refills (2 sheets, 3.25" x 10") - CF-3

(Note: Copper donuts and foil are 1 oz. copper,.0016" thickness. The copper is passivated to retard corrosion and permit easy soldering.)





CF-1	$14.25
CF-2	$4.35
CF-3	$5.60

PC MINI DRILL

Precision performance and features at an economical price. A versatile, portable drill suitable for most light drilling applications. Particularly designed with PC board work in mind, but capable of handling metal and plastic chassis boxes too. Adjustable speed operates from 8000 RPM to 15,000RPM with a well-geared motor for high torque. An external power jack permits use with a 12VDC to 18VDC power supply or DC adapter. Included with the Drill are three collets and two drill bits. Additional PC Board type drill bits sold below.

VTHD12N $12.95

PCB SIZE DRILL BITS

For drilling component lead wire holes in printed circuit boards. Made of high speed tool steel for long life. 6 of the most popular sizes available.

2 PER PACK		
12-564	#52 (.064" DIA.)	$2.49
12-552	#55 (.052" DIA.)	2.49
12-540	#60 (.040" DIA.)	2.89
12-535	#65 (.035" DIA.)	3.29
12-532	#67 (.032" DIA.)	3.29
12-528	#70 (.028" DIA.)	3.79

*Most Popular #52, #60, & #67

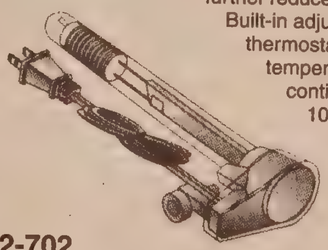
POSITIVE TYPE DEVELOPER CONCENTRATE

For developing photo sensitized PC boards coated positive type etch resist. To be diluted with 3 parts water to 1 part of developer. 8 oz. will develop 10 to 20 sq. ft. of PC board.

12-402	BOTTLE 2 FL OZ. 59ML	$3.45
12-404	BOTTLE 4 FL OZ. 177 ML	$5.79

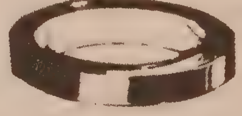
ETCHING SOLUTION HEATER

Fits in tank and heats solution up to 38° C (100F). Used to further reduce etching time. Built-in adjustable thermostat controls temperature continuously to 100°F, 120V AC/ 100W Max.



12-702 .... $7.95

PURE COPPER CIRCUIT TAPE



6-foot roll of self-adhesive pure copper tape for quick repairs or circuit modification. Adheres readily to PC boards and similar surfaces; solders readily. Flexible enough to be used around corners, between PC boards, between board and chassis, etc. Extremely low resistance (.002" thick). Supplied on 1" I.D. core.

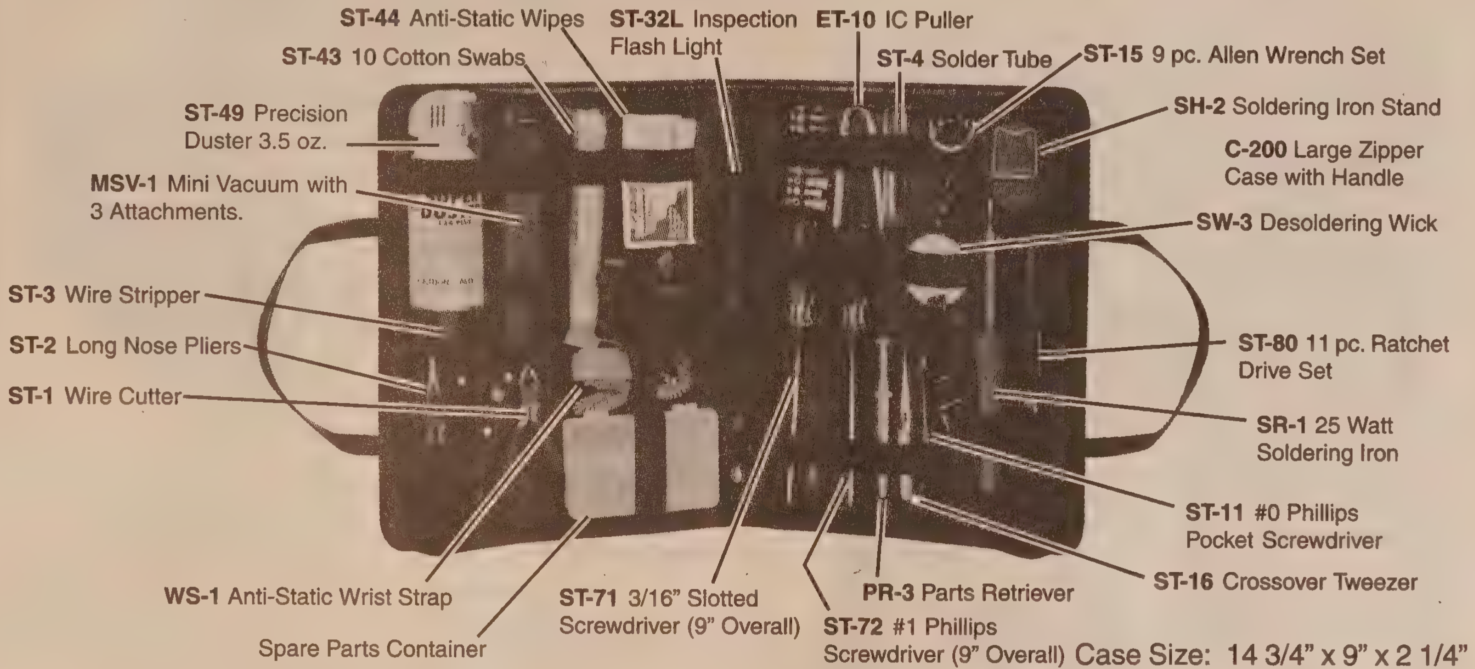
22-507	1/16" WIDE	$3.05
22-509	1/8" WIDE	$3.80

ELENCO COMPUTER TOOL KITS ELENCO

Deluxe 50pc. Computer Technician Service Tool Kit

Model TK-1700..$79.95

A complete tool kit for the repairing and maintaining of computers and electronic devices. Included in this kit is a powerful mini-vacuum with attachments and a pressurizedcanned duster to remove debris or dust. OVER 50 TIMES.


ST-44 Anti-Static Wipes
ST-32L Inspection Flash Light
ET-10 IC Puller
ST-43 10 Cotton Swabs
ST-4 Solder Tube
ST-15 9 pc. Allen Wrench Set
ST-49 Precision Duster 3.5 oz.
SH-2 Soldering Iron Stand
C-200 Large Zipper Case with Handle
MSV-1 Mini Vacuum with 3 Attachments.
SW-3 Desoldering Wick
ST-3 Wire Stripper
ST-2 Long Nose Pliers
ST-80 11 pc. Ratchet Drive Set
ST-1 Wire Cutter
SR-1 25 Watt Soldering Iron
ST-11 #0 Phillips Pocket Screwdriver
ST-16 Crossover Tweezer
WS-1 Anti-Static Wrist Strap
ST-71 3/16" Slotted Screwdriver (9" Overall)
PR-3 Parts Retriever
ST-72 #1 Phillips Screwdriver (9" Overall)
Spare Parts Container

Case Size: 14 3/4" x 9" x 2 1/4"

Deluxe 29pc. Computer Service Tool Kit

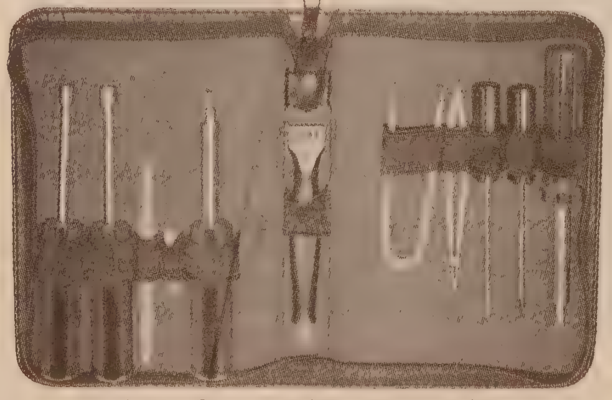
Model TK-1200..$46.95

Includes:

- Deluxe Soldering Iron
- Solder Tube
- 5" Needle Nose Pliers
- 4 1/2" Diagonal Pliers
- Spare Parts Tube
- 3-prong Parts Retriever
- 11 pc. Screwdriver Bit Set (3 Nut Drivers, 2 Slotted, 2 Phillips, 3 Star)
- Soldering Iron Stand (Wire Form)
- 4 pc. Soldering Ease with Heat Sink
- Deluxe Wire Stripper
- IC Inserter 14-16 pin
- IC Extractor
- 1/8" Slotted Screwdriver
- #0 Phillips Screwdriver
- Desoldering Pump
- Tweezer

All contained in a black vinyl zippered case.

Case Size: 13" x 7" x 2"



Case Size: 8 3/8" x 6" x 1 3/8"

12pc. Computer Service Tool Kit

Model TK-1100............................$15.95

Includes:

- 3/16" Nut Driver
- 1/4" Nut Driver
- Driver Handle - Fits all bits
- Reversible Screwdriver Bits T10 & T-15
- Reversible Screwdriver Bits 3/16" & 1/4"
- Reversible Screwdriver Bits #1 & #2 Phillips
- Tweezer
- IC Inserter 14-16 pin
- IC Extractor
- 1/8" Flat Screwdriver
- #0 Phillips Screwdriver
- 3-prong Parts Retriever

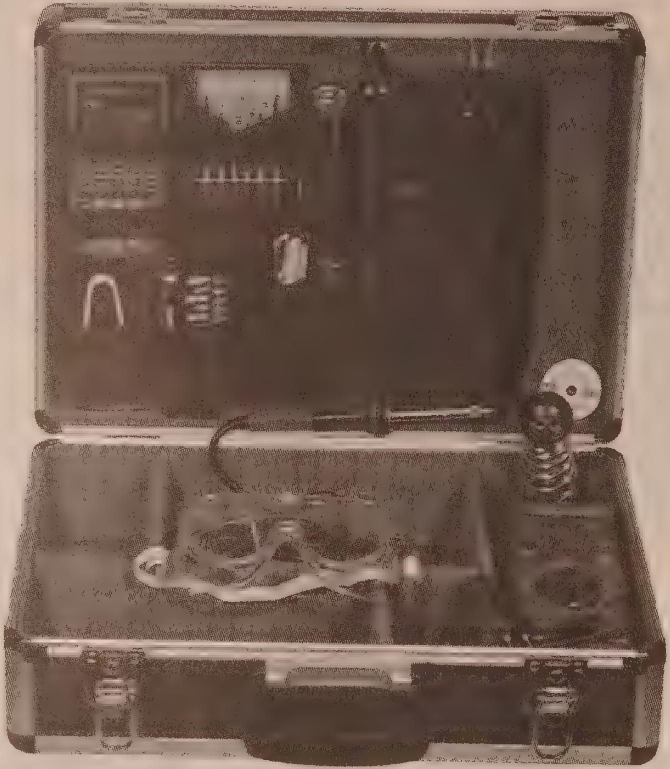
All contained in a black vinyl zippered case.

2 YEAR WARRANTY ON ALL TOOLS

ELENCO DELUXE ELECTRONIC TOOL KITS ELENCO

Tool Kit Model TK-3000..........$89.95

A professional technician service tool kit in a metal reinforced tool case with heavy-duty handle and locks. A removable, double-sided pallet handles most of the tools listed below with more room for tools and parts in the lower half. A special ramp in the tool case will lock your meter of choice in place.



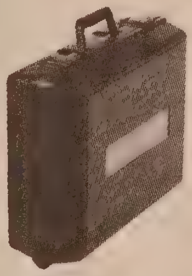
Tools Included in Case:
- **SR-2B** - Deluxe Soldering Iron
- **SH-1** - Soldering Iron Stand
- **ST-1** - Diagonal Pliers
- **ST-2** - Long Nose Pliers
- **ST-30** - Deluxe Wire Stripper
- **SE-1** - Solder Ease Kit
- **TL-8** - Precision Screwdriver Set
- **SW-3** - Solder Wick
- **ST-72** - Screwdriver Slotted 3/16"
- **ST-71** - Screwdriver #1 Phillips
- **ET-10** - IC Puller
- **SP-2** - Solder Pump
- **ST-20** - Safety Goggles
- **ST-9** - Pocket Screwdriver
- **ST-4** - Solder Tube
- **ST-75** - 11 pc. Driver Set
  (3 Nut Drivers, 2 Slotted, 2 Phillips, & 3 Star)
- **Meter Sold Separately.**

Case Size:
6 1/2" (H) x
18" (W) x
13" (D)

Tool Kit Model TK-1000..........$49.95

New in the electronics educational field. A professional organizer tool kit at affordable prices. No student should be without this unique tool kit that holds all of the tools you need (meter, experiments, etc.).

Tools Included in Case:
- **ET-10** - IC Puller
- **SE-1** - Solder Ease Kit
- **SH-1** - Soldering Iron Stand
- **SP-2** - Solder Pump
- **SR-2B** - Deluxe Soldering Iron
- **ST-1** - Diagonal Pliers
- **ST-2** - Long Nose Pliers
- **ST-3** - Wire Stripper
- **ST-4** - Solder Tube
- **ST-20** - Safety Goggles
- **ST-75** - 11 pc. Driver Set
- **SW-3** - Solder Wick
- **TL-8** - Precision Screwdriver Set
- **TM-40** - Tool Mounting Kit
- **Meter Shown is Sold Separately.**



Case Size: 5 1/4" (H) x 16 3/8" (W) x 12 1/4" (D)

2 YEAR WARRANTY ON ANY TOOL IN THIS KIT

ELENCO DELUXE TECHNICIAN SERVICE TOOLS ELENCO

(Case Size: 14 3/4" x 9" x 2 1/4")

All contained in a black vinyl zippered case with handles.

Deluxe 32pc. Technician Tool Kit

Model TK-1500.............................$49.95

Includes:

- M-1000B Digital Multimeter
- Deluxe Soldering Iron
- Solder Ease Kit
- Desoldering Pump
- Diagonal Pliers
- Long Nose Pliers
- Parts Box
- Deluxe Wire Stripper
- IC Puller
- Soldering Iron Stand (Wireform)
- Precision Screwdriver Set
- Solder Tube
- Solder Wick
- 11 pc. Screwdriver Bit Set (3 Nut Drivers, 2 Phillips, 2 Slotted, 3 Star)

Model TK-1600 (Same as above but without meter)................$39.95

15pc. Basic Technician Tool Kit

Model TK-1350.........................$39.95

Includes:

- Deluxe Soldering Iron
- 5" Needle Nose Pliers
- 4 1/2" Diagonal Pliers
- Deluxe Wire Stripper
- Screwdriver 3/16" Slotted
- Screwdriver 1/8" Slotted
- Screwdriver #1 Phillips
- Screwdriver #0 Phillips
- Desoldering Pump
- Soldering Iron Stand (Wire Form)
- Solder Tube
- Nut Driver 3/16"
- Nut Driver 5/16"
- Nut Driver 1/4"

Model TK-1300 - Same as above except includes standard soldering iron and standard wire stripper

(Case Size: 13" x 7" x 2")

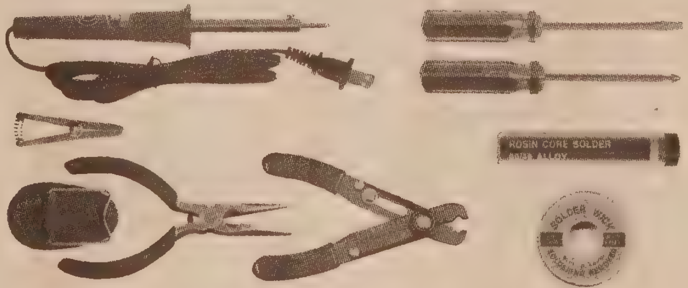
High quality tools in black vinyl zippered case.

9 Piece Electronic Technician Starter Tool Kit

Model TK-14....................$13.95

Consists of:

SR-1 Soldering Iron 25W
ST-2 Long Nose Pliers
ST-3 Wire Strippers
ST-5 Screwdriver Slotted
ST-6 Screwdriver #1 Phillips
SH-2 Soldering Iron Holder
SW-3 Solder Wick
ST-4 Solder
ST-23 Heat Sink

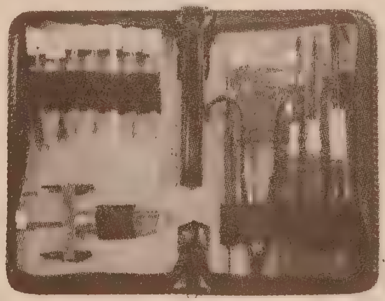


15 Piece VCR Service Tool Kit

Model TK-1400....................$39.95

Consists of:

- Inclined Base Screwdriver
- Eccentric Screwdriver
- Post Adjustment Screwdriver
- 2 Fine Adjust Screwdrivers (2mm & 3mm)
- VHS VCR Head Puller
- Retaining Ring Remover
- 3 Reversible Screwdrivers
- Spring Hook Tool
- Micro Screwdriver
- Hex Wrench Set



Hand Tool Kit

Model ST-10...$9.95

Consists of:

ST-1 - Diagonal Cutter
ST-2 - Long Nose Pliers
ST-3 - Wire Strippers
ST-5 - Screwdriver Slotted
ST-6 Screwdriver #1 Phillips

Solder Tool Kit

Model ST-12...$9.95

Consists of:

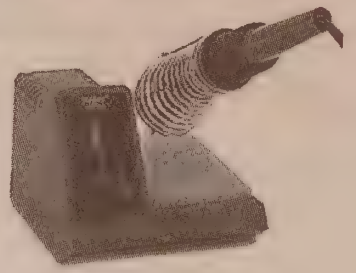
SR-1 - Soldering Iron 25W
SP-2 - Desoldering Pump
SW-3 - Solder Wick
ST-4 - Solder

ROSIN CORE SOLDER

2 YEAR WARRANTY ON ALL TOOLS

SOLDERING STATIONS

Famous Weller WLC-100



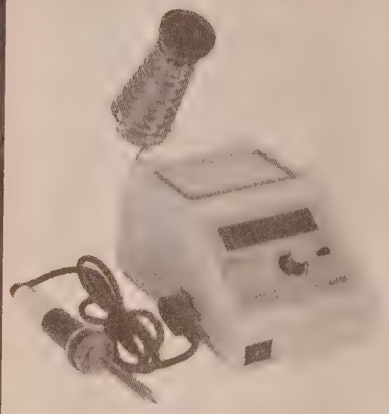
Low cost with professional Quality. Variable temp. and uses standard tips.

- On/Off Lighted Power Switch
- Variable Power Controls Produce 5-40 Watts
- Quality Lightweight Pencil Iron
- Cushioned Foam Grip with Replaceable Heating Elements
- Safety Guard Iron Holder
- Natural Sponge Tip Cleaning Pad
- Comes with ST3 Iron Plated Copper Tip
- UL Listed

WLC-100		$39.95
ST-1	Screwdriver Tip .06"	$2.95
ST-3	Screwdriver Tip .12"	$2.95
ST-7	Conical Tip .03"	$2.95

Deluxe Temperature Controlled Soldering Stations

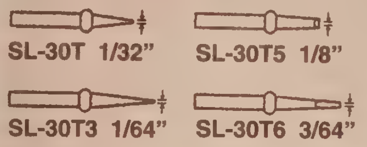
- LED Readout for greater accuracy (SL-30 only)
- Temperature range 300°F to 900°F



SL-30

This hi-tech soldering station incorporates a sophisticated electronic circuit which enables the user to change the tip temperature from 300°F (150°C) to 900°F (480°C). The temperature is maintained within ±10OF of its preset temperature. The tip is isolated from the AC line by a 24V transformer. The tip is grounded to eliminate static charges.

Tips $3.75

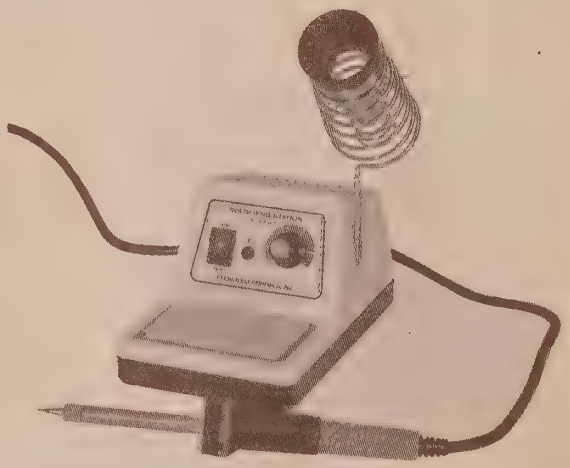


SL-10

SL-30	$99.95
SL-10	$79.95

SL-5 Series Soldering Stations

The **SL-5 Soldering Station** is electronically controlled to provide 5 to 40 or 60 watts and is ideal for professionals, students, and hobbyists. The unit includes a holder funnel for the iron, sponge pad for cleaning the tip and an on/off indicator light. It is available assembled or in kit form.



Features:

- ⚠ **Ground Fault Safety Circuit**

  LED turns on when the following problems are present at the power source.

  1. Open Ground.
  2. Hot and Ground Reversed (Bright when Switch is Off, Dim with Switch On).
  3. Hot and Neutral Reversed.
- Cushion Grip Handle Soldering Iron with Grounded Tip for Soldering Static-Sensitive Devices. Easily Replaceable. Uses Long-Life, Plated Conical Tip.
- Heavy Steel, Non-Slip Base.
- Iron Holder Funnel - Reversible, left or right side.
- Steel Tray for Sponge Pad.
- Sponge Pad.
- Power On/Off with Indicator Light.

ASSEMBLED SOLDERING STATIONS

Model SL-5 is the station that comes without a soldering iron. You may plug in any iron and obtain variable heat. It is suggested that you use 40 watt or 60 watt irons.

Model SL-5-40 - This station comes complete with a 40 watt soldering iron providing you with variable heat - 5 watts to 40 watts. For general soldering requirements.

SOLDER STATION KITS

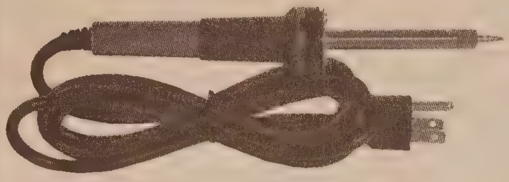
Model SL-5K is a solder station in kit form. The soldering iron is not included. You build the station with your own soldering iron (40 watt iron suggested). Ideal for student projects.

Model SL-5K-40 - A solder station in kit form using a 40 watt soldering iron that is included to build the station. The 40 watt soldering iron then becomes part of the station.

SL-5	$19.95
SL-5-40	$29.95
SL-5K	$19.95
SL-5K-40	$29.95

SOLDERING EQUIPMENT

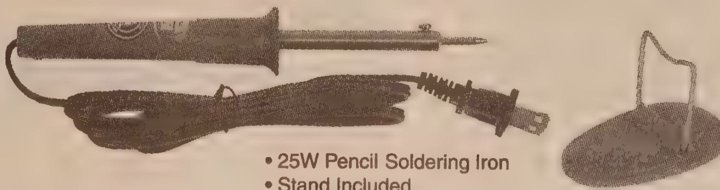
Deluxe 25W Soldering Iron



- 3 wire grounded plug
- Screw-in tip
- Rubber sleeve handle with long-life plated tip

SR-2B		**$8.95**
SR-2BTC	**Conical Replacement Tip**	**$2.50**
SR-2BTW	**Wedge Replacement Tip**	**$2.50**

Standard Soldering Iron



- 25W Pencil Soldering Iron
- Stand Included

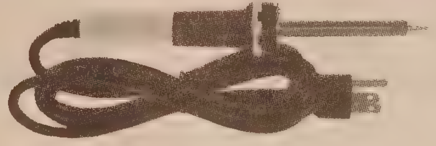
SR-1		**$4.75**
SR-IT	**Conical Replacement Tip**	**$1.50**

Professional Soldering Iron

- 25 Watts
- Ceramic Elements
- Long-life Tip
- Rubber Sleeve

SR-3B		**$13.25**
SR-3T	**Conical Replacement Tip**	**$3.75**

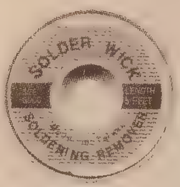
Deluxe 40W Soldering Iron



- 3 wire grounded plug
- Screw-in tip
- Rubber sleeve handle with long-life plated tip

SR-6		**$8.25**
SR-2BTC	**Conical Replacement Tip**	**$2.50**
SR-2BTW	**Wedge Replacement Tip**	**$2.50**

Desoldering Wick



Solder removal braid removes solder from all types of connections. 5 Foot Roll

SW-3 .... $1.25

Tip Tinner, Cleaner

Tip Tinner & Cleaner

Prevents oxide build-up. Prolongs tip life and heat transfer.

TTC-1 .... $5.95

Safety Goggles

- Contours to head • Soft vinyl frame • Ventilated **(Safety Approved)**

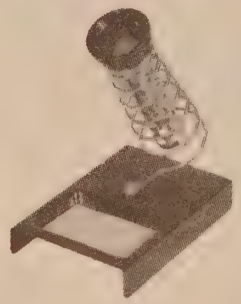
ST-20 .... $2.50

Safety Spectacles

- Wide upper frame. • Fits over prescription glasses. **(Safety Approved)**

ST-22 .... $4.25

Soldering Iron Holder



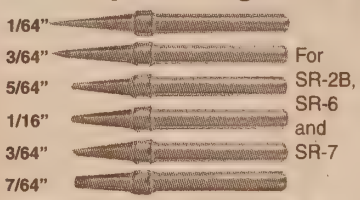
SH-1 .... $4.95

Solder Ease Kit

- 4 pc. Set
- Brush, Scraper, Probe, and Heatsink in Pouch

SE-1 .... $2.50

Soldering Iron Tip Package

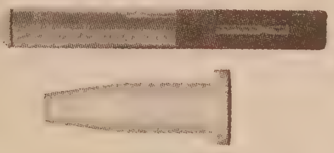


For SR-2B, SR-6 and SR-7

TIPK-1 .... $9.95

Desoldering Pump

Aluminum housing with Teflon tip



SP-2		**$4.95**
SP-2T	**Replcement Tip**	**$1.50**

SOLDER 60/40 ROSIN CORE

Designed to fill most soldering needs. 60% tin/40% lead with rosen core to assure good connections.

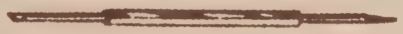
P/N	DESCRIPTION	PRICE
S4141	1lb. .062"(14GA) dia.	9.95
S4161	1lb. .047"(16GA) dia.	9.95
S4201	1lb. .032"(20GA) dia.	9.95
S4145	1/2lb. .062"(14GA) dia.	4.95
S4165	1/2lb. .047"(16GA) dia.	4.95
S4205	1/2lb. .032"(20GA) dia.	4.95
S4160	Plastic vial w/6' of .047" dia.	1.58
S4210V	Plastic vial w/12' of .032" dia.	1.58

CLIP-ON HEAT SINK

Spring-loaded aluminum heat sink clips onto lead of heat-sensitive component that needs to be soldered. Disssipates heat safely without damaging component.

SH675 .... $1.49

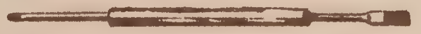
REAMER & SCRAPER TIP



Reamer and scraper tips for scraping joints or reaming out lug holes.

S969 Plastic Handle 7" length $1.75

BRUSH & FORKED TIP



Brush on one end, forked tip on the other is for twisting or holding wires.

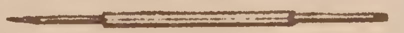
S973 Plastic Handle 7" length $1.75

BRUSH & SCRAPER TIP

Brush on one end for dusting away excess solder chips, and scraper tip for scraping joints.

S974 Plastic Handle 7" length $1.75

STRAIGHT REAMER & FORKED TIP



Made from stainless steel, solder will not stick to it. Forked tip on one end, straight reamer on the other.

S975 Plastic Handle 7" length $1.75

ANGLED REAMER & FORKED TIP

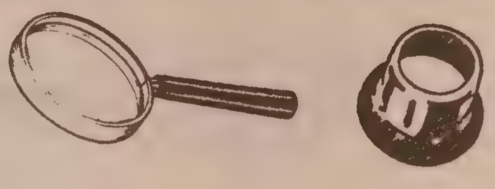
Heat treated tool steel prevents solder from sticking to tool. Forked tip for twisting or holding wires, angle reamer on the other.

S976 Plastic Handle 7" length $1.75

MAGNIFIERS & ALIGNMENT TOOLS

MAGNIFIERS

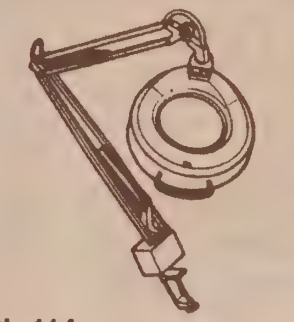
A must for hobbyists, technicians, and repairmen. Great for identifying small parts or for finding broken traces on a PCB.



PART NO.	SIZE DIA. X LENGTH	POWER	DESCRIPTION	PRICE
21-750	1”	10X	Eye loupe	**2.95**
21-752	2”	5X	Eye loupe	**2.95**
21-770	2 1/4” x 4 1/2”	2.5X, 5X	Round w/handle	**5.95**
21-772	2 1/2” x 5 1/2”	2X, 4X	Round w/handle	**6.95**
21-774	3 1/4” x 7”	2X, 4X	Round w/handle	**7.95**

FLOURESCENT MAGNIFYING LAMP

- UL Approved
- Steel 39” extension arm: Properly balanced for easy maneuverability and positioning. Will clamp to any work surface up to 2 1/4” thick.
- Springs with adjustable tensioning knobs at all joints.
- 18 AWG/2 Conductor SPT-1 AC cord with polarized plug. 120V/60Hz.
- 3-1/4” Diameter lens with magnification lens of 3x (3 diopter).
- Supplied with 22W flourescent lamp.
- Attractive, durable white molded housing, base and clamp.



This fine precisioned product is excellent for inspection of printed circuit boards and any fine detail work. A must for the technician laboratory and the production line.

SL-114 .... $59.95

RADIO & TV ALIGNMENT TOOLS

AMATEUR RADIO & CB ALIGNMENT KIT

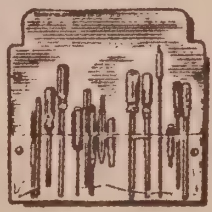
A must for every amateur operator, CB'er, or repairman — eight of the finest made precision tools serving a multitude of purposes. For tuning I.F. transformers, RF coils, antennas and oscillator coils, plus countless other fine, intricate adjustments.

Contains 1 each of the following:

- Duplex No-Metal Screwdriver
- K-Tran Tool
- Core Aligner
- Duplex Aligner
- Zenith Aligner Tool
- Hex Iron Core Tool
- Transistor Tool
- Double End Tool

18-530 .... $9.95

GENERAL PURPOSE ALIGNMENT TOOL KIT



A good general purpose alignment tool kit for most applications. For amateur equipment, TV sets, AM/FM radios and CB sets.

Contains 1 each of the following:

- Wire Dressing Tool
- K-Tran Tool
- Deplex Aligner
- Zenith Aligner Tool
- “Shorty” Aligner
- 2-IN-1 Tool — 7”
- Tel-A-Turn Tool 1
- Tel-A-Turn Tool 2
- Tel-A-Turn Tool 3
- Oiler
- Zenith-RCA Alignment Tool
- Brush/Forked Tip Tool
- Screwdriver — 7”

582 .... $29.95

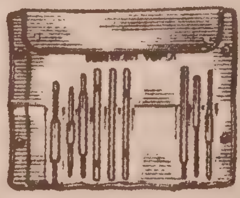
ANTI-STATIC GENERAL PURPOSE ALIGNMENT TOOL KIT

Kit contains nine anti-static alignment tools. The wide range of tip styles and sizes assures that the user will have a tool for adjusting or aligning any conventional component. Supplied with pocket storage case.

Kits contains 1 each:

- Adjustment Screwdriver
- Combination Aligner
- Steel Tip Duplex Aligner
- Small Hex & Screwdriver
- Hex & Tip Tool
- Mini Potentiometer & Trimmer Tool
- Double Ended Hex Tool
- 3-in-1 Hex Core Tool
- Square & Hex Tool

AS-5007 .... $10.95



DELUXE ALIGNMENT TOOL KIT

Handy roll type case of durable leatherette that contains the most frequently used alignment tools. Case has fold-over flap to prevent tools from becoming lost.

Kit contains 1 each:

- K-Tran Tool
- Neutralizing Tool
- Alignment Wrench
- TV Channel Tuning Tool
- TV-FM Tuning Tool
- Core Aligner
- TV Aligner
- Long-Reach Aligner
- Universal Aligner
- Duplex Aligner
- “Shorty” Duplex Aligner
- Tuning Wand
- Core Aligner
- Zenith Alignment Tool
- Hex Wrench—5”
- Potentiometer Adjustment Tool

8280 .... $27.95

RADIO-TELEVISION ALIGNMENT TOOL KIT

Handy roll type case of durable leatherette that contains the most frequently used alignment tools. Case has fold-over flap to prevent tools from becoming lost.

Kit contains 1 each:

- Alignment Screwdriver
- Adjustment Screwdriver
- Neutralizing Tool
- Alignment Wrench
- K-Tran Tool
- TV Channel Tuning Tool
- TV-FM Tuning Tool
- Core Aligner
- TV Aligner
- Long Aligner
- Universal Aligner
- Duplex Aligner
- “Shorty” Duplex Aligner
- Adjustable Shorty Tool
- Core Aligner
- Zenith Aligner Tool
- “Shorty” Aligner
- Universal Aligner
- Hex Wrench — 5”
- Alignment Tool
- 2-IN-1 Alignment
- Tool — 9”
- 2-IN-1 Alignment
- Tool — 7”
- Alignment Tool
- Screwdriver — 7”
- Tel-A-Turn Tool
- Adjustable Shorty Tool

8283 .... $41.95

TOOLS FOR THE ELECTRONIC INDUSTRY

POCKET SCREWDRIVER
Slotted 1/8" x 2" with Clip.

Overall 4 1/4"

ST-9 .... $.95

SCREWDRIVER
Slotted 1/8" x 3".

Overall 5 1/4"

ST-101A $1.40

SCREWDRIVER
Slotted 3/16" x 3" Chrome Vanadium.

Overall 6"

ST-5 .... $1.60

SCREWDRIVER
Phillips #1 x 3" Chrome Vanadium.

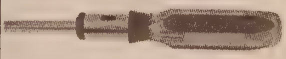
Overall 6"

ST-6 .... $1.60

11 PIECE SCREWDRIVER BIT SOCKET SET

- 3 Nut Drives
- 2 Slotted
- 2 Phillips
- 3 Star

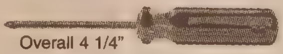
ST-75 .... $6.50



Same as above with rachet drive

ST-80 .... $7.95

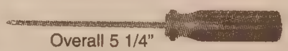
POCKET SCREWDRIVER
Slotted #0 x 2" with Clip.



Overall 4 1/4"

ST-11 .... $1.20

SCREWDRIVER
Slotted #0 x 2" with Clip.



Overall 5 1/4"

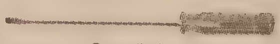
ST-101B $1.40

SCREWDRIVER
Chrome Vanadium Shaft.

Overall 9"

ST-71:#1 Philips $2.95
ST-71A: #2 Philips .. $3.95

SCREWDRIVER
Slotted 3/16" x 6" Chrome Vanadium.



Overall 9"

ST-72 .... $2.95

SCREWDRIVER
Phillips #2 x 4" Chrome Vanadium.

Overall 7 1/2"

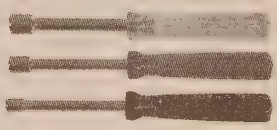
ST-7 .... $1.60

SCREWDRIVER
Slotted 1/4" x 4" Chrome Vanadium.

Overall 7 1/2"

ST-40 .... $1.60

NUT DRIVER SET
3pc. Color Coated Handles - 3/16", 1/4", and 5/16".



ND-3 .... $3.25

MAGNETIZER / DEMAGNETIZER
Easily magnitize or demagnetize screwdrivers or other tools.

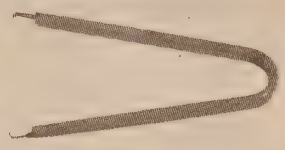
DEMAGNETIZER
MAGNETIZER

ST-51 .... $4.95

HEMOSTAT
Straight 6" Insulated Handle - Use as a clamp to hold parts in place.

ST-19 .... $4.95

IC PULLER
Stainless Steel Construction for Removing IC's. Insulated Vinyl Grip.

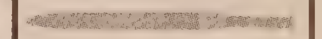


ET-10 .... $1.40

IC INSERTER
14/16 Pin.

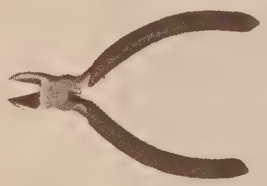
ET-14 .... $3.25

PARTS RETRIEVER
3 Prong. Pick Up Parts in Hard-to-Reach Places.



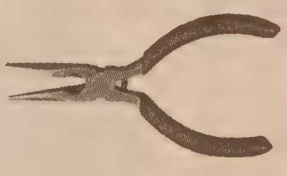
PR-3 .... $1.60

MINI DIAGONAL CUTTER
Drop Forged Steel, Return Spring, Cushion Grip - 4 1/2" Long



ST-1 .... $3.25

MINI LONG NOSE PLIER
Drop Forged Steel, Return Spring, Cushion Grip - 5" Long

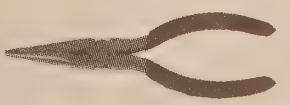


ST-2 .... $3.25

DIAGONAL CUTTER
Drop Forged Steel, Cushion Grip 6" Long

ST-26 .... $4.95

LONG NOSE PLIER
Drop Forged Steel, Cushion Grip 6" Long

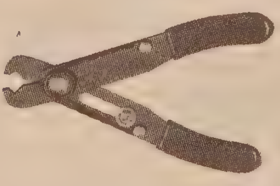


ST-34 .... $4.95

ALLEN WRENCH SET
8pc. Ring Set with Springs - Twists Off, Twist On

ST-15 .... $3.25

WIRE STRIPPER
Adjustable Wire Stripper, Return Spring, Cushion Grip - 5" Long



ST-3 .... $3.25

7-in-1 All ALL PURPOSE WIRE STRIPPER, CUTTER, PLIER, & CRIMPER
Wire Loop. AWG 16-26, 6 1/2" Long

ST-30 .... $5.95

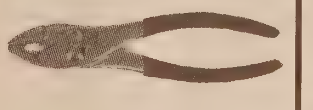
Same as above except wire strips AGW 10-18

ST-30A $5.95

DELUXE WIRE STRIPPER
Knife type blade cuts, strips AWG 12-24; cushion grip, return spring, 6" long.

ST-30Y $5.95

SLIP JOINT PLIER
Drop Forged Steel, Chrome Plated, Cushion Grip - 6 1/2" Long.



ST-8 .... $3.25

ANTI-STATIC WORK MAT
Protect your work station from static discharge. Made of semiconductive vinyl. 11" x 22".

WS-2 .... $10.95

Mat Size; 19" x 23"

WS-3 .... $13.95

INSPECTION FLASHLIGHT
Use 2 AA Batteries NOT INCLUDED

ST-32 .... $3.25

6" RULER
Etched Metal. Inch and Metric Division with Pocket Clip.

ST-14 .... $2.50

ELECTRICIAN KNIFE
2 Blades, Spear and Screwdriver with Shackle at end.

ST-36 .... $11.95

MINI-VACUUM CLEANER
Includes three attachments. Requires 4 "AA" batteries NOT INCLUDED.

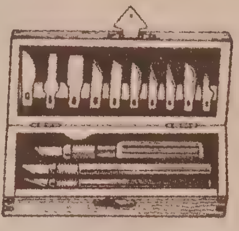
MSV-1 .... 11.50

ANTI-STATIC WRIST STRAP
Protects ICs and other Equipment from Static Discharges. *Adjustable*

WS-1 .... $5.95

TOOLS

PRECISION KNIFE SET



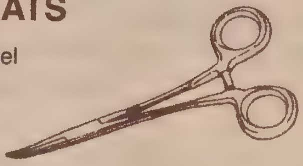
KIT CONTAINS:
- 3 Knife Handle Sizes
- 1 Blade Holder
- 10 Assorted Blades
- Durable Solid Case for easy storing

This kit is a must for the hobbyist or anyone working with PC artwork. Very handy for many uses in the lab.

10250 .... $13.95

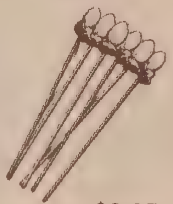
HEMOSTATS

- Stainless steel
- Vinyl grips



LENGTH	JAW SHAPE	PART NO.	PRICE
5”	Straight	21-680	**7.75**
5”	Curved	21-682	**7.75**
6”	Straight	21-684	**8.50**
6”	Curved	21-686	**8.50**

COTTON SWABS

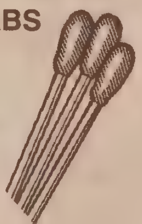


Cotton tipped swabs for general cleaning with Alcohol, Freon TF, 1,1,1 Trichloroethane, etc. 6" length, package of 50 swabs.

10-270 Swabs (50 pcs.) $2.95

FOAM CLEANING SWABS

VIDEO AUDIO

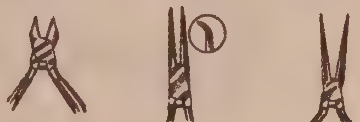


By keeping heads clean on recorders, the equipment will operate longer. These swabs are NOT cotton but soft foam, making them lintless, as well as reusable. 6" long.

SC20 Pack of 20 .... $3.15

SC20B Package of 100 swabs $12.95

STAINLESS STEEL PROFESSIONAL TOOLS



These finely machined stainless tools are durable and long-lasting. Extremely comfortable in user's hand. The cushioned handle grips provide very high insulation. All three tools are furnished with spring for ease-of-use. No finer value available today.

SA-703 side cutter $6.94

SA-704 needle point pliers $6.94

SA-705 curved needle point pliers . $6.94

MINIATURE NUT DRIVER SET

Precision made 5-piece set in view-type plastic case. Sizes range from 5/64" to 5/32". Each nut driver has swivel top, hot for T-bar for extra leverage.

90-824 .... $5.95

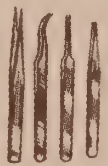
JEWELER'S PRECISION SCREWDRIVER KIT

(SLOT TYPE)

Kit contains 6 most popular sizes. Each screwdriver has a swivel top, shrome-plated, brass-knurled handles. Blades are hardened tempered steel.

98-805 .... $5.95

PRECISION TWEEZERS 4 1/2" LENGTH



These quality, stainless steel tweezers are excellent for electronic and fine assembly conditions.

10132	Self-closing fine point	**3.25**
10134	Regular fine point	**3.25**
10136	Curved fine point	**3.25**
10138	Flat water tip	**3.25**
10130	Kit of 4 tweezers	**9.95**

5-WAY ALL PURPOSE WIRE TOOL

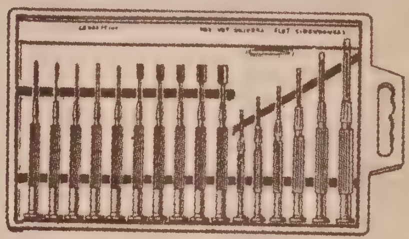
Features large comfortable plastic grip handles. A one piece tool that shapes and cuts wire 5 different ways.
- Standard wire cutter
- Crimps insulated terminals: 22-14 AWG, 12-10 AWG
- Shears 5 bolt sizes: 4-40, 6-32, 8-32, 10-24, 10-32
- Crimps non-insulated terminals: 10-12 AWG, 14-16 AWG, 15-22 AWG
- Strips wire 10 to 22 AWG

The overall length of the tool is 9" and is made of hardened steel. Matte black permanent finish with bright, clear markings makes it an attractive and easy-to-use product.

WS16 .... $5.79

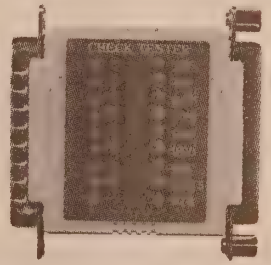
16-PIECE MULTI-PURPOSE MINIATURE TOOL KIT

This kit contains 6 blade screwdrivers (0.8 to 3.8mm); 4 Phillips screwdrivers (2-No. 0 and 2-no. 1); 3 Allen-type drivers (1, 5, 2.0 & 2.5mm); 3 Hex nut drivers (3, 4 & 5mm); plastic case.



90-806 .... $18.95

RS-232 CHECK TESTER



Used to monitor the 7 most commonly used data lines to see if equipment has failed. Seven 2-color LEDs check status of TD, RD, RTS, CTS, DSR, CD & DTR.

CT-100 .... $9.95

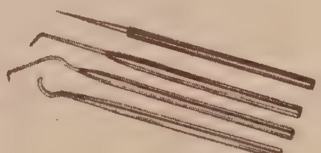
6” DIAL CALIPERS

- Hardened satin chrome plated steel
- Precision ground jaws
- Thumb roll for easy adjustment
- Slide lock to hold readings
- Adjustable dials
- Micro-fine graduations

PART NO.	SIZE	PRICE
21-647	0-150mm	37.30
21-648	0-6”	32.85

PROBE SETS

- 4 Pieces per set
- Stainless steel
- Vinyl pouch
- 5 1/2” long



VERY HANDY TOOL TO HAVE AROUND

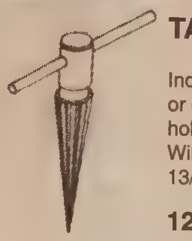
21-690 .... $9.95

10 PIECE ELECTRONIC COMBINATION WRENCH SET

This fine quality set of 10 combination wrenches is excellent for electronic repair and service. The size and thickness are especially suited for technician needs. The wrenches are the following sizes: 5/32", 3/16", 1/4", 7/32", 15/64", 5/16", 9/32", 3/8", 11/32", and 7/16". All are hot forged and chrome plated.

63-608 .... $11.95

TOOLS, DECADE BOXES & COAX STRIPPERS

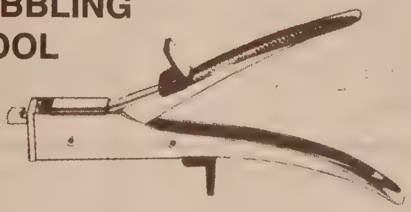


TAPER REAMER

Indispensable for work on chassis or cabinet. Start with 1/8" or larger hole and enlarge to required size. Will also remove burrs. Tapers to 13/16".

12-040 .... $18.60

NIBBLING TOOL



Unique hand-operated tool cuts metal and non-brittle plastic. Will cut any size or shape contour, starting from the edge or from a 3/8" inside hole. Tool cuts steel up to 18 gauge (0.046") as well as copper, brass, aluminum and plastics up to 1/16" (0.062")

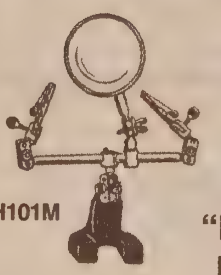
10150 .... $10.95

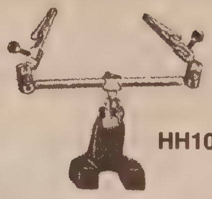
5 PIECE CHASSIS PUNCH SET

Why spend $44 on 1 when you can have 5 for the same price. Excellent quality, one of our best selling items.

Complete set of punches in a leatherette carrying case. All precision machined of top grade steel. Following sizes: 5/8", 11/16", 3/4", 1", 1 3/16" plus burring reamer.

110E $43.95





"HELPING HANDS"

The Assembly Aid is a unique "two-handed" holding fixture for aiding all types of electronic and mechanical asembly work. Quick and easy clamping and release. Two strong alligator clips are mounted in ball joints, and the connecting bar is mounted in a thick ball joint, enabling complete articulation and flexibility to suit any task. Ideal for PC board stuffing, electronic projects, mechnical work, model making, etc.

- Alligator clips hold workpiece
- Ball joint flexibility
- Locks in any position
- Heavy cast metal base
- All metal construction

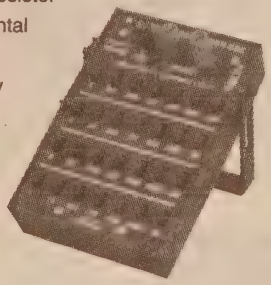
HH101 without magnifying glass....... $6.95

HH101M magnifying glass attached $7.95

RESISTANCE DECADE BOX

For The Design Engineer, Service Technician, Experimenter
All Resistors ±1% At 1 Watt

A helpful aid to help determine the best value of a resistor needed in experimental circuits. Values may be changed instantly in one ohm increments by setting switches.

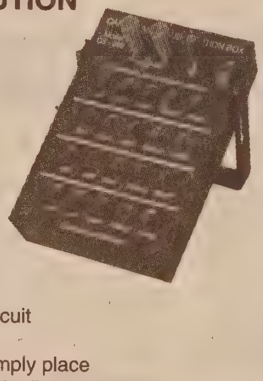


SPECIFICATIONS

Size	3 5/8"W x 6"L x 2 1/8"H
Case	ABS hi-impact & aluminum
Accuracy	± 1% tolerance minimum
Range	From 1 Ohm to 11M Ohms

RS-500 .... $39.95

CAPACITANCE SUBSTITUTION UNIT



Excellent for circuit development—easy to use. Simply place wires in unit and adjust switches to determine capacitor value. Dual contact slide switches allow simple adding or subtracting to the value desired. Rugged, sturdy design, 5 1/2" x 3 1/2" x 1 5/16".

SPECIFICATIONS:

Range	100pF to 10mFd
Precision	2% capacitors throughout
Voltage	200 Volt DC, non-polarized

CS-600 .... $59.95

RESISTANCE WHEEL

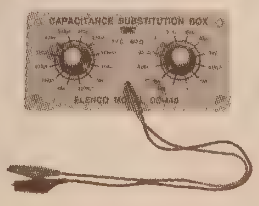
Helps select resistors for any circuit. Color-coded insulated alligator clips attach easily to circuit and easily readable dial, then indicates resistor value when rotated. 1/4 watt, 5% resistor values (5ohms—1mΩ), 100 V max.

12-104 .... $18.95

CAPACITOR SUBSTITUTION BOX

Contains 12 different value capacitors from 100pF to 1μF.

CS-440 ....$21.95



AVAILABLE AS A KIT

K-38 ....$14.95

RESISTOR SUBSTITUTION BOX

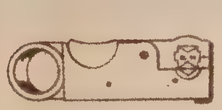
Contains 24 different value capacitors from 10Ω to 1meg.

RS-440 ....$21.95

RESISTANCE SUBSTITUTION BOX
ELENCO MODEL RS-400

AVAILABLE AS A KIT

K-37 ....$14.95



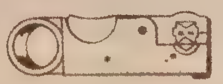
COAXIAL CABLE STRIPPER

RG8 - RG11 - RG213

Performs 3 cuts in one motion. Our most popular with the HAMS.

24-7739 .... CABLE STRIPPER $24.95

99-7739 ... REPLACEMENT BLADES (PKG 3) $3.00



COAXIAL CABLE STRIPPER

RG58 - RG59 - RG62 - RG6

This convenient tool will perform 2 step stripping of RG58, RG59, RG62 and RG6 coaxial cable. Features 4 way reversible block to accommodate all of these cables. Tool is easily adjusted for non-standard cables with 2 adjustment screws. Jacket stripping blade is adjustable for 2 different stripping lengths.

WS145 .... CABLE STRIPPER $15.95

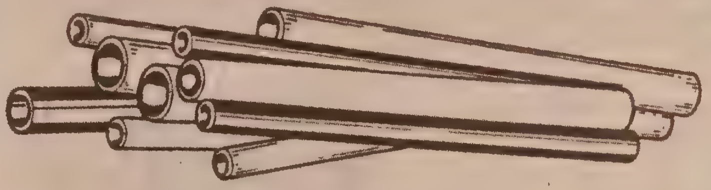
WSB ..... REPLACEMENT BLADES (PKG 4) $2.49

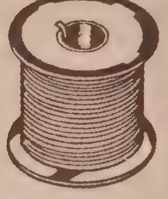
HEAT SHRINK, FISH PAPER, TAPES & CHEMICALS

HEAT SHRINK TUBING

This grade of heat shrink tubing is rated for general purpose Electrical & Mechanical Insulation. The construction is "thin Wall Crosslinked Polyolefin". Thin Wall heat Shrinkable tubing is used in a varirty of applications including: Harnessing and strain relief, Insulation and protection of electronic components, High volume terminal protection, and High performance Medical equipment. Available in 6" lengths, 4 foot lengths,and 100 foot rolls.

Specifications:
- **Flame Retardent**
- **Solvent Resistant**
- **Meets: UL224 & CSA C22.2#198.1 @125°**
  Mil-DLT-23053/5 & AMS 3636 & 3637
- **Continous Operating Temp. + -55° - 135°**
- **Shrink Temperature 120°C**
- **Shrink Ratio=2:1**



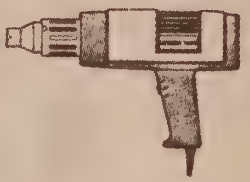


6" LENGTH BLACK				4' LENGTH BLACK			100' ROLL BLACK		
PART NO.	SIZE	QTY/PK	PRICE/PK	PART NO.	SIZE	PRICE	PART NO.	SIZE	PRICE
12-916	1/16"	10	2.60	12-916-4	1/16"	.95	12-916-100	1/16"	22.80
12-918	1/8"	10	2.60	12-918-4	1/8"	1.05	12-918-100	1/8"	24.40
12-920	3/16"	10	2.60	12-920-4	3/16"	1.25	12-920-100	3/16"	29.90
12-922	1/4"	8	2.60	12-922-4	1/4"	1.60	12-922-100	1/4"	36.00
12-924	3/8"	8	2.60	12-924-4	3/8"	1.80	12-924-100	3/8"	39.00
12-926	1/2"	6	2.60	12-926-4	1/2"	1.95	12-926-100	1/2"	44.50
12-928	3/4"	4	2.60	12-928-4	3/4"	2.60	12-928-100	3/4"	58.60
12-930	1"	3	2.60	12-930-4	1"	3.90	12-930-100	1"	87.90

HEAT GUN

UL Listed, 115V AC

A dual range heat gun for use in heating shrink tube and drying coatings, adhesives, etc. Low temperature range setting produces a nominal 700°F (2,000 BTU's), high range 975°F(4,000 BTU's). Maximum setting draw 10 Amps. A light weight design that is easy to handle. Designed so that it may be put down to cool without a special holder. UL Listed.



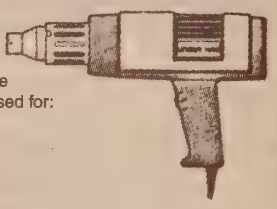
12-997 .... $45.60

HEAT GUN KIT

UL Listed 117 VAC 100Watts

Includes 2 tips and tip removal tool. The HD866 is a dual range gun. The low range covers 500°F and the high range covers 900°F – 1100°F. This fine quality product can be used for:

- Heat Shrink Tubing
- Drying Metal
- Shrink Wrap Film
- Window Shrink Films
- Paint Removal
- Drying Ignition Systems
- Banding Plastic/Plexiglass
- Frozen Locks



HD866 .... $34.95

FISH PAPER, COAX SEAL, & TAPE

FYBERIOD "FISH PAPER"

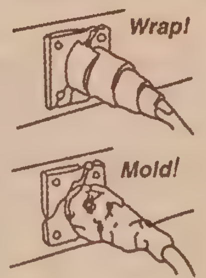
The insulating properties of this "Fish Paper" make it ideal for many uses. It is commonly used around the shop where electrical insulation is needed. It is tough, flexible, and combined with its edge-tearing resistance and high dielectric strength make it a great product for slot car insulation, It is also very absorbent of insulating varnishes.

Specifications:
Color: Blue Gray
Thickness: .010" ± 10%
Material: Vulcanized cellulose Fiber
Tensile Strength: 15,000 PSI Typical
Insulating Properties: 300V/mil
tearing strength: 375 grams
Zn Cl Content = <.05%
UL94 flame Class: 94HB UL file #E55656
Mil Spec # MIL-1-695A type F
10" X 26" rolled

12-5600 10" x 26" Roll $3.40

COAX SEAL™
HAND MOLDABLE PLASTIC

Effectively seals all types of coaxial fittings; balun; antenna parts and connectors of any shape — adheres to vinyl and polyvinyl coax outer jackets. Simply wrap it on like regular tape, then mold it to shape. It stays flexible and sealed at any temperature for years to resist moisture penetration and deterioration. Permanent flexibility makes it possible to remove and re-install fittings, and reseal them by simply re-reforming the same material. Non-toxic, non-contaminating, and non conductive. Roll, 1/2: wide x 60" long.



25-7995 .... $4.95

ECONOMY VINYL ELECTRICAL TAPE

This electrical tape is designed to compete with the imports, however the stretch, adhesion and weather-resistant qualities are far superior.
3/4" X 60'

LT1219 .... $1.00

CHEMICALS

BIG BATH CONTACT CLEANER

Contact Cleaner

Excellent cleaner and degreaser. Effective on switches, motors, PC boards, other components. BIG BATH can be used to dissipate moisture in electronic and electrical equipment.

50-9012 .... $9.60

(12 oz. spray can) Contains no CFC's

FREEZE MIST

Freeze Mist

A refrigerant spray used to locate thermal intermittents in electronic components. Also great for removing chewing gum from fabrics and freezing adhesives for easy removal.

50-8910 .... $7.40

(10 oz. spray can) Contains no CFC's

AIR JET

High pressure product is used for blowing dust, dirt and residue out of hard to reach places.

Applications: computers, keyboards, printers, fax machines, audio/video equipment, and amateur gear.

50-8710 .... $7.40

(10 oz. spray can) Contains no CFC's

FLUX REMOVER & CLEANER

Flux Remover

Aerosol. Convenient, fast and easy to use. Removes all types of organic flux. Pinpoint applicator supplied.

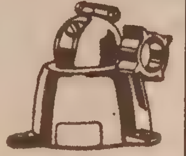
50-2610 .... $10.45

(Aerosol 10 oz.) Contains no CFC's

PANAVISE WORK HOLDING DEVICES PANAVISE

For over 40 years, Panavise Work Holding Devices have become more of a necessity then a convenience for any work bench. Circuit board holder #315, along with any base, excels at holding a circuit board while soldering or repairing components. Standard head #303 is excellent for holding connectors while you solder them or other small parts. Why not make your life easier. Order a Panavise product today.

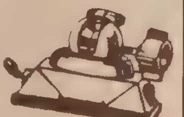
STANDARD BASE (300)



Standard base holds all regular 300 series heads and PCB holders Split-ball feature permits work in various positions - turns and tilts. 3 base mounting holes in the lugs allow permanent mounting of base.

PAN 300 .... $19.95

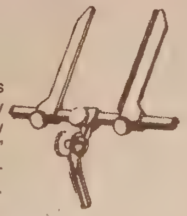
VACUUM BASE (380)



A special base for portable applications. Moving the black-tipped lever arm attaches the vacuum base instantly to any smooth non-porpous surface, without maring. A flip of the lever releases the base. Accepts all 5/8" stems into base. Special head can tilt 45 degrees.

PAN 380 .... $31.99

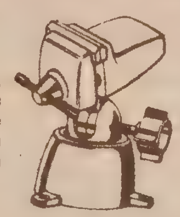
CIRCUIT BOARD HOLDER (315)



Circuit board holder: holds PC boards of any shape, up to 12" wide in any position. Tension arm permits easy board insertion. Both arms extend 6" from the bar, with V-grove grip designed to hold PCB's up to 5/32" thick. fits all 300 series bases.

PAN 315 .... $29.99

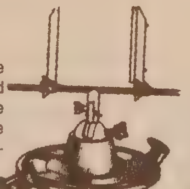
STANDARD PANAVISE (301)



All purpose work holding unit. It tilts, turns and rotates. This combination consists of the 300 Standard Base and the 303 Standard Head which has 2 1/2" wide nylon jaws that open 2 1/4" for firm but damage free grip. Control knob locks the work firmly in any position.

PAN 301 .... $42.99

ELECTRONIC WORK CENTER (324)

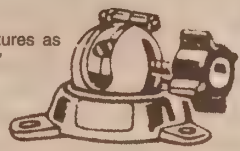


A complete electronic work center. The work station gives you a circuit board holder, standard base, tray base mount, and solder station, all in one package. Keeps work areas more efficient and manageable.

Soldering iron not included.

PAN 324 .... $76.99

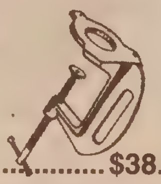
LOW PROFILE BASE (305)



Low profile base has same features as model 300 except it is only 2 1/2" high, for working close to bench surface.Can also be permanently mounted.

PAN 305 .... $19.95

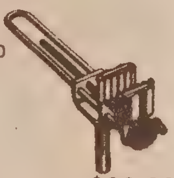
BENCH CLAMP (311)



Bench clamp designed for bases 300 and 305 with screws supplied. Height 6 3/4", throat depth 2 3/8", gripping range 0"-3 1/2".

PAN 311 .... $38.99

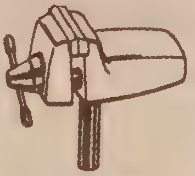
WIDE OPENING VERTICAL VISE HEAD (366)



Wide opening vertical vise head fits all 300 series bases. Neoprene reversible, replaceable pads, rotates 360°. Tilt action 180°, grip range 0"-6", jaw pad width 1 3/4", throat depth 2".

PAN 366 .... $30.99

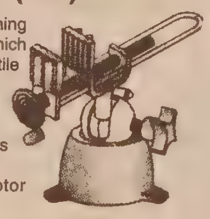
STANDARD VISE HEAD (303)



Standard vise head has 2 1/2" wide nylon jaws that open 2 1/4" and allow firm but damage-free grip. Fits 300 and 305 bases.

PAN 303 .... $23.99

WIDE OPENING HEAD (396)

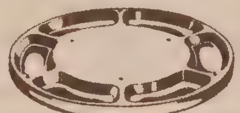


A combination of the 366 Wide Opening Head and the 300 Standard Base, which makes this holding device very versatile for production lines, technicians, and designers. It opens to a full 6" to accommodate most PC boards. The deep-ribbed neoframe jaw pads reverse to hold delicate cylindrical objects: such as timers, coils, motor armatures, etc.

PAN 396 .... $45.99

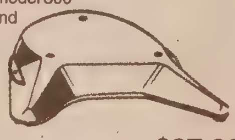
TRAY BASE MOUNT (312)

Designed for the low profile, and standard base. This is a very stable work platform, yet is easily portable. Six individual trays are cast into base for holding of small parts. Tray mount is exceptionally stable and resists tipping. It has 6 non-marring, anit-skid base pads. Standard base attached with 3 screws included with base.



PAN 312 .... $19.99

WEIGHTED BASE MOUNT (308)



Weighted base mount holds model 300 or 305 base with 3 screws and nuts, which are included. Weights 5 lbs., cast iron.

PAN 308 .... $27.99

REPLACEMENT JAWS FOR 303 AND 304* HEADS

Model 343 — The 343 Nylon Jaws are included with the 303 Standard Head. These jaws offer excellent electrical insulation and gentle holding power. Made of type 66 nylon, they will withstand intermittent heat to 300°F (149°C), or a continuous 200°F (193°C).

PAN 343 .... $2.49

Model 344 — The 344 Grooved Nylon Jaws are similar to the 343 Nylon Jaws except that they have a small horizontal groove running the width of the jaws. Perfect for holding small tubes, rods, and circuit boards firmly in place.

PAN 344 .... $3.49

Model 353 — These husky jaws are recommended when working with high heat or heavy objects.

PAN 353 .... $5.99

Model 354 — The 354 Brass Jaws are a non-marring alternative to the 353 Steel Jaws for heavy or high heat applications.

PAN 354 .... $7.49

***All jaws sold in pairs**

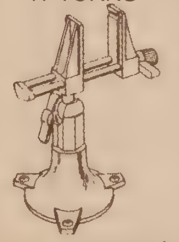
***Model 304 available on special order.**

PANAVISE JR. — THE VISE THAT BECOMES A TOOL

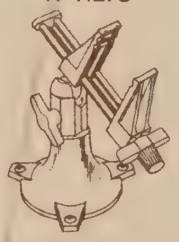
Great for Do-It-Yourselfers, for hobby work, for general repair around the house as well as professional electronics, jewelry and camera repair.

There is no other vise like it that "twists, turns and tilts" to hold everything just the way you want it.

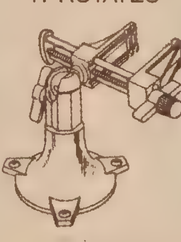
IT TURNS



IT TILTS



IT ROTATES

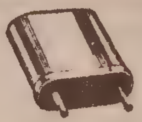


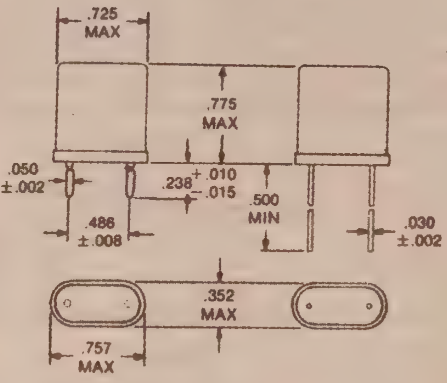
Model 201 — This popular, small precision PanaVise has all of the traditional "tilt, turn and rotate" features of its big brothers. More like a tool than a vise, the grooved jaws open to 2 7/8" (74mm) and are made of fiber reinforced thermal composite alloy. Jaws are controlled with a fine/coarse adjusting knob which permits very delicate work. Head movement is through three planes (360° rotation, 360° swivel and 210° pivot) and is controlled with a single knob. The PVJr.'s base is made of die cast zinc for years of continuous use, with a 4 5/16" (111mm) bolt circle countersunk for 1/4" (6mm) flathead bolts (not included)
This unique vise is 6 3/4" (173mm) tall, weighs 1 1/4 lbs. (0.6kg),

PAN201 .... $21.95

CRYSTALS, CLOCK OSCILLATORS, CERAMIC RESONATORS

AMATEUR BAND TRANSMITTING CRYSTALS IN STOCK!





We are stocking the following transmitting crystals. No more waiting 3-5 weeks for your "custom crystal". All crystals may be used with any QRP transmitter project found in your favorite books or magazines.

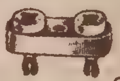
SPECIFICATIONS

- HC6U style
- 50 PPM tolerance
- 30 PF load capacitance
- Fundamental mode

PART NO.	FREQ MHz	BAND	PRICE EACH
CY3540	3.540	80M	9.65
CY3560	3.560	80M	9.65
CY3710	3.710	80M	9.65
CY3720	3.720	80M	9.65
CY7030	7.030	40M	9.65
CY7035	7.035	40M	9.65
CY7040	7.040	40M	9.65
CY7045	7.045	40M	9.65
CY7110	7.110	40M	9.65
CY7125	7.125	40M	9.65
CY1010	10.106	30M	9.65
CY1011	10.110	30M	9.65
CY1015	10.115	30M	9.65
CY1012	10.120	30M	9.65
CY1403	14.030	20M	9.65
CY1404	14.040	20M	9.65
CY1405	14.050	20M	9.65
CY1406	14.060	20M	9.65
CY2104	21.040	15M	9.65
CY2106	21.060	15M	9.65
CY2111	21.110	15M	9.65
CY2112	21.120	15M	9.65

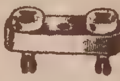
CRYSTAL SOCKETS

Low-loss ceramic crystal socket are preferred for all hf & vhf applications and feature silver plated phosphor - bronze contacts for maximum reliability and long life; ceramic is silicone impregnated to repel moisture.



HC6/U
.05" PINS
SPACED .487"

CS6U $4.95



FT-243
.094" PINS
SPACED .487"

CS243 .... $5.95

CRYSTALS

CRYSTALS ARE USED AS A TIME BASE OR AS A TIME FUNCTION TO ENSURE THE CLOCK STABILITY FOR MICROPROCESSOR CIRCUITS.

HC18/U (HC49/U) Case

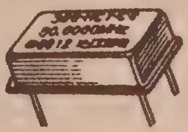
HC33/U Case

TF Case

PART NO.	FREQUENCY	CASE STYLE	PRICE	PART NO.	FREQUENCY	CASE STYLE	PRICE	PART NO.	FREQUENCY	CASE STYLE	PRICE
CY1	1.000 MHZ	HC33U	4.95	CY5.71	5.7143 MHZ	HC18U	1.25	CY13.51	13.5168 MHZ	HC18U	1.25
CY1.84	1.8432 MHZ	HC33U	3.49	CY6	6.000 MHZ	HC18U	1.25	CY14.31	14.31818 MHZ	HC18U	1.25
CY2	2.000 MHZ	HC33U	2.95	CY6.14	6.144 MHZ	HC18U	1.25	CY15	15.000MHZ	HC18U	1.25
CY2.45	2.4576 MHZ	HC18U	1.25	CY7.37	7.3728 MHZ	HC18U	1.25	CY16	16.000 MHZ	HC18U	1.25
CY3.27	3.2768 MHZ	HC18U	1.25	CY8	8.000 MHZ	HC18U	1.25	CY18	18.000 MHZ	HC18U	1.25
CY3.57	**3.57545 MHZ**	**HC18U**	**1.25**	CY9.83	9.8364 MHZ	HC18U	1.25	CY20	20.000 MHZ	HC18U	3.00
CY3.68	3.6864 MHZ	HC18U	1.25	CY10	10.000 MHZ	HC18U	1.25	CY32	32.000 MHZ	HC18U	3.00
CY4	4.0000 MHZ	HC18U	1.25	CY10.73	10.73863 MHZ	HC18U	1.25	CY32.76	32.768KHZ	TF	3.00
CY4.91	4.9152 MHZ	HC18U	1.25	CY11	11.000MHZ	HC18U	1.25	CY40	40.000MHZ	HC18U	1.25
CY5.06	5.0688 MHZ	HC18U	1.25	CY12	12.000 MHZ	HC18U	1.25				

TTL CRYSTAL CLOCK OSCILLATORS

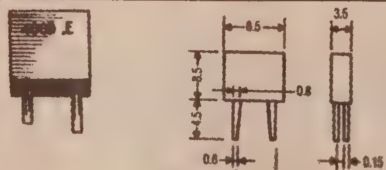
A SINGLE COMPONENT OSCILLATOR UTILIZING A COMBINATION OF THICK FILM HYBRID AND QUARTZ CRYSTAL TECHNOLOGY. INPUT VOLTAGE: +5VDC, ±0.5VDC. ALL OSCILLATORS FIT INTO A STANDARD 14-PIN DIP SOCKET.



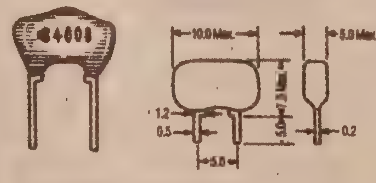
PIN #	FUNCTION
1	N/C
7	GND
8	OUTPUT
14	+5VDC

PART NUMBER	DESCRIPTION	PRICE EACH	PART NUMBER	DESCRIPTION	PRICE EACH
40-74000	4.0000MHZ, 0.01%, CLOCK OSCILLATOR	3.95	40-81600	16.0000MHZ, 0.01%, CLOCK OSCILLATOR	3.95
40-74915	4.9152MHZ, 0.01%, CLOCK OSCILLATOR	3.95	40-81625	16.2570MHZ, 0.01%, CLOCK OSCILLATOR	3.95
40-75000	5.0000MHZ, 0.01%, CLOCK OSCILLATOR	3.95	40-81843	18.4320MHZ, 0.01%, CLOCK OSCILLATOR	3.95
40-75068	5.0688MHZ, 0.01%, CLOCK OSCILLATOR	3.95	40-81966	19.6608MHZ, 0.01%, CLOCK OSCILLATOR	3.95
40-76000	6.0000MHZ, 0.01%, CLOCK OSCILLATOR	3.95	40-82000	20.0000MHZ, 0.01%, CLOCK OSCILLATOR	3.95
40-78000	8.0000MHZ, 0.01%, CLOCK OSCILLATOR	3.95	40-82400	24.0000MHZ, 0.01%, CLOCK OSCILLATOR	3.95
40-81000	10.0000MHZ, 0.01%, CLOCK OSCILLATOR	3.95	40-85140	32.5140MHZ, 0.01%, CLOCK OSCILLATOR	3.95
40-81200	12.0000MHZ, 0.01%, CLOCK OSCILLATOR	3.95	40-84000	40.0000MHZ, 0.01%, CLOCK OSCILLATOR	3.95
40-87456	14.7456MHZ, 0.01%, CLOCK OSCILLATOR	3.95	40-84800	48.0000MHZ, 0.01%, CLOCK OSCILLATOR	3.95

CERAMIC RESONATORS



200KHz–1000KHz



3.58MHz–10MHz

FEATURES:

- LOW COST
- SUPERIOR ENVIRONMENTAL CHARACTERISTICS
- COST EFFECTIVE
- SMALL AND LIGHT-WEIGHT
- STABLE AGAINST DROP SHOCK AND VIBRATION
- STABLE TEMPERATURE CHARACTERISTICS (±0.3%)

APPLICATIONS:

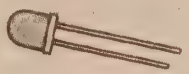
- MICROPROCESSOR TIMING
- DIGITAL EQUIPMENT
- LSI TIMING FOR TELEPHONE CIRCUITS
- LSI TIMING FOR REMOTE CONTROL DEVICES
- CLOCK OSCILLATORS FOR MICROPROCESSORS
- LSI OSCILLATORS FOR VOICE SYNTHESIZERS AND TELEPHONES
- REMOTE CONTROL EQUIPMENT

PART NUMBER	FREQUENCY	PRICE EACH
CR200HZ	200KHZ	1.25
CR400HZ	400KHZ	1.25
CR455HZ	455KHZ	1.25
CR500HZ	500KHZ	1.25
CR540HZ	540KHZ	1.25
CR640HZ	640KHZ	1.25
CR800HZ	800KHZ	1.25
CR1000HZ	1000KHZ	1.25
CR358MZ	3.58MHZ	1.25
CR4MZ	4.0MHZ	1.25
CR6MZ	6.0MHZ	1.25
CR8MZ	8.0MHZ	1.25
CR10MZ	10.0MHZ	1.25

LED'S, NUMERIC DISPLAYS & BAR GRAPH DISPLAY

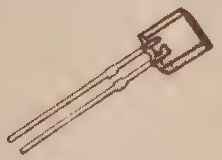
Discrete LED'S

Discrete LED's are ideal for pilot or indicator light applications due to long life and estremely low power consumption. Standard-bright LED's require only 1.4 volts d.c. for operation. Can be used up to 28 volts d.c. with appropriate series resistor. Available in red, yellow, green and orange. T1 LED can be mounted in 80-0100 holder. T1 3/4 LED can be mounted in 80-0134.

STYLE	PART NO.	COLOR	SIZE	PRICE	
				1-99	100+
T1 (.125 DIA.) 	65-3220	RED	T1	.20	.13
	65-3222	YELLOW	T1	.25	.15
	65-3224	GREEN	T1	.25	.15
	65-3226	ORANGE	T1	.25	.15
T1 3/4 (.190 DIA.) 	75-4220	RED	T1 3/4	.20	.13
	75-4222	YELLOW	T1 3/4	.25	.15
	75-4224	GREEN	T1 3/4	.25	.15
	75-4226	ORANGE	T1 3/4	.25	.15

Rectangular LED's

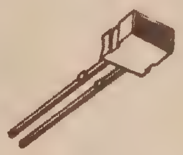
A high performance rectangular LED that is stackable in either the X or Y direction. Diffused matte light emitting surface with wide viewing angle. Operates on 1.9 volts minimum (or 2.6 volts maximum).



PART NO.	COLOR	PRICE	
		1-99	100+
85-5220	RED	.45	.35
85-5222	YELLOW	.45	.35
85-5224	GREEN	.45	.35

Rectangular LED Indicator

Rectangular LED indicator with a .220" X .125" lighted area. High brightness output for maximum visibility. No light leakage from unit or sides. Solid state reliability. Stackable in either the X or Y direction. Compact, rugged, lightweight. Available in green, red and yellow.



PART NO.	COLOR	PRICE	
		1-99	100+
95-6220	RED	.85	.70
95-6224	GREEN	.85	.70

Red/Green Tri-State LED

Color changes from red to green depending on direction of biasing. Two LED's mounted in the same package. True polarity indicating. Three states: red, green, off. T-1 3/4 size lens. Mounts in 80-0134 mounting clips.

95-5240 .... **$.95**

SELF FLASHING LED'S

T 1 3/4 SIZE VOLTAGE 4.5-5.5 VDC@20mA

PART NO.	COLOR	PRICE EACH
55-7290	RED	1.25
55-7291	YELLOW	1.60
55-7292	GREEN	1.35

LED MOUNTING HARDWARE

Back snap-in LED mounting clips for T1 & T 1 3/4 size LED's. Clips easily mount from front of panel. Designed for applications where simple, low cost installation, attractive apperance and dependable, positive mountings are important.

80-0100 T1 SIZE .... **.20**
80-0134 T1 3/4 SIZE .... **.20**

HIGH EFFICIENCY RED LED

Red LED's do a good job at reduced current, such as in the 5 to 10mA range; much brighter than other red LED's at standard 10 to 20mA current. Unlike the highly directional superbright types, these are bright when viewed from a wide angle, making them excellent indicator lamps.

85-1021 .... **$.35**

BRIGHT WHITE LED

LED, White Light. This is an exceptional bright LED with a white light. If operated in it's rated range, it should never burn out, ever. Current 10mA to 20mA. Use for power indicator or even for small, lightweight and low current flashlight, keyhole finder etc..

85-107................................ **$3.80**

DISPLAYS

LED NUMERIC DISPLAYS

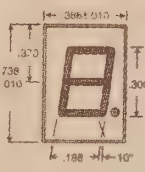


FIG. A

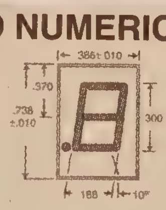


FIG. B

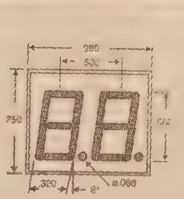
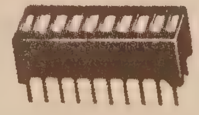


FIG. C (DUAL DIGIT)

PART NO.	FIG.	DESCRIPTION	COLOR	PINS	SIZE	PRICE
MAN71A	A	COMMON ANODE RHDP	RED	14	.30"	1.49
MAN72A	B	COMMON ANODE LHDP	RED	14	.30"	1.49
MAN74A	A	COMMON CATHODE RHDP	RED	14	.30"	1.49
MAN3410A	A	COMMON ANODE RHDP	GREEN	14	.30"	1.49
MAN3420A	B	COMMON ANODE LHDP	GREEN	14	.30"	1.49
MAN3810A	A	COMMON ANODE RHDP	YELLOW	14	.30"	1.49
MAN3820A	B	COMMON ANODE LHDP	YELLOW	14	.30"	1.49
MAN6710	C	COMMON ANODE	RED	24	.56"	2.49
MAN6740	C	COMMON CATHODE	RED	24	.56"	2.49

Bar Graph Display - 10 Segment

A high efficiency bar graph display with large segments, closely spaced. Fast switching, excellent for multiplexing. Directly compatible with IC's. Low power consumption. Wide viewing angle. End stackable. Standard .3" DIP lead spacing.



PART NO.	COLOR	PRICE
PCMD57164	RED	3.50
PCMD53164	YELLOW	3.80
PCMD54164	GREEN	3.80

METAL FILM 1/4W 1% RESISTORS

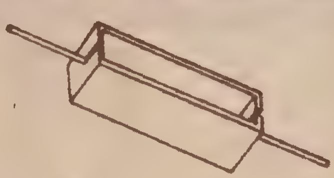
10.0	26.1	68.1	178	464	1.21K	3.16K	8.25K	21.5K	56.2K	147K	383K
10.2	26.7	69.8	182	475	1.24K	3.24K	8.45K	22.1K	57.6K	150K	392K
10.5	27.4	71.5	187	487	1.27K	3.32K	8.66K	22.6K	59.0K	154K	402K
10.7	28.0	73.2	191	499	1.30K	3.40K	8.87K	23.2K	60.4K	158K	412K
11.0	28.7	75.0	196	511	1.33K	3.48K	9.09K	23.7K	61.9K	162K	422K
11.3	29.4	76.8	200	523	1.37K	3.57K	9.31K	24.3K	63.4K	165K	432K
11.5	30.1	78.7	205	536	1.40K	3.65K	9.53K	24.9K	64.9K	169K	442K
11.8	30.9	80.6	210	549	1.43K	3.74K	9.76K	25.5K	66.5K	174K	453K
12.1	31.6	82.5	215	562	1.47K	3.83K	10.0K	26.1K	68.1K	178K	464K
12.4	32.4	84.5	221	576	1.50K	3.92K	10.2K	26.7K	69.8K	182K	475K
12.7	33.2	86.6	226	590	1.54K	4.02K	10.5K	27.4K	71.5K	187K	487K
13.0	34.0	88.7	232	604	1.58K	4.12K	10.7K	28.0K	73.2K	191K	499K
13.3	34.8	90.9	237	619	1.62K	4.22K	11.0K	28.7K	75.0K	196K	511K
13.7	35.7	93.1	243	634	1.65K	4.32K	11.3K	29.4K	76.8K	200K	523K
14.0	36.5	95.3	249	649	1.69K	4.42K	11.5K	30.1K	78.7K	205K	536K
14.3	37.4	97.6	255	665	1.74K	4.53K	11.8K	30.9K	80.6K	210K	549K
14.7	38.3	100	261	681	1.78K	4.64K	12.1K	31.6K	82.5K	215K	562K
15.0	39.2	102	267	698	1.82K	4.75K	12.4K	32.4K	84.5K	221K	576K
15.4	40.2	105	274	715	1.87K	4.87K	12.7K	33.2K	86.6K	226K	590K
15.8	41.2	107	280	732	1.91K	4.99K	13.0K	34.0K	88.7K	232K	604K
16.2	42.2	110	287	750	1.96K	5.11K	13.3K	34.8K	90.9K	237K	619K
16.5	43.2	113	294	768	2.00K	5.23K	13.7K	35.7K	93.1K	243K	634K
16.9	44.2	115	301	787	2.05K	5.36K	14.0K	36.5K	95.3K	249K	649K
17.4	45.3	118	309	806	2.10K	5.49K	14.3K	37.4K	97.6K	255K	665K
17.8	46.4	121	316	825	2.15K	5.62K	14.7K	38.3K	100K	261K	681K
18.2	47.5	124	324	845	2.21K	5.76K	15.0K	39.2K	102K	267K	698K
18.7	48.7	127	332	866	2.26K	5.90K	15.4K	40.2K	105K	274K	715K
19.1	49.9	130	340	887	2.32K	6.04K	15.8K	41.2K	107K	280K	732K
19.6	51.1	133	348	909	2.37K	6.19K	16.2K	42.2K	110K	287K	750K
20.0	52.3	137	357	931	2.43K	6.34K	16.5K	43.2K	113K	294K	768K
20.5	53.6	140	365	953	2.49K	6.49K	16.9K	44.2K	115K	301K	787K
21.0	54.9	143	374	976	2.55K	6.65K	17.4K	45.3K	118K	309K	806K
21.5	56.2	147	383	1.00K	2.61K	6.81K	17.8K	46.4K	121K	316K	825K
22.1	57.6	150	392	1.02K	2.67K	6.98K	18.2K	47.5K	124K	324K	845K
22.6	59.0	154	402	1.05K	2.74K	7.15K	18.7K	48.7K	127K	332K	866K
23.2	60.4	158	412	1.07K	2.80K	7.32K	19.1K	49.9K	130K	340K	909K
23.7	61.9	162	422	1.10K	2.87K	7.50K	19.6K	51.1K	133K	348K	931K
24.3	63.4	165	432	1.13K	2.94K	7.68K	20.0K	52.3K	137K	357K	953K
24.9	64.9	169	442	1.15K	3.01K	7.87K	20.5K	53.6K	140K	365K	976K
25.5	66.5	174	453	1.18K	3.09K	8.06K	21.0K	54.9K	143K	374K	1.00M

MUST BE ORDERED IN MINIMUM INCREMENTS OF 5 EACH PER VALUE.

HOW TO ORDER	PRICING 1/4W METAL FILM 1%	
PART NO. RM (VALUE)	5-95 PCS	100+ PCS
EXAMPLE: RM22.6	.10 EACH	$3.00/100

POWER RESISTORS 5 WATT 10 WATT

5 WATT and 10 WATT 5% CEMENT WIREWOUND



FEATURES:

- Sealed with a special cement
- Excellent flame and moisture resistance
- High temperature stability
- Ceramic flame retardant package
- Temperature coefficient ±250
- Welded internal connections

TABLE OF VALUES IN (OHMS)								
0.10	0.33	0.75	3.0	12	56	330	1.8K	10K
0.12	0.36	0.82	3.3	15	68	390	2.2K	11K
0.15	0.39	0.91	3.9	18	82	470	2.7K	12K
0.18	0.43	1.0	4.7	22	100	560	3.3K	15K
0.20	0.47	1.2	5.1	24	120	680	3.9K	*18K
0.22	0.51	1.5	6.2	27	150	820	4.7K	*22K
0.24	0.56	1.8	6.8	33	180	1.0K	5.6K	*27K
0.27	0.62	2.2	8.2	39	220	1.2K	6.8K	*10W
0.30	0.68	2.7	10	47	270	1.5K	8.2K	ONLY

PRICING	
5 WATT	
PART NO.	PRICE EACH
R5-(VALUE)	$.55
10 WATT	
PART NO.	PRICE EACH
R10-(VALUE)	$.65

5% CARBON FILM 1/4W &1/2W

RESISTORS

5% CARBON FILM 1/4W & 1/2W

1.0	4.7	22	100	470	2.2K	10K	47K	220K	1.0M	4.7M
1.1	5.1	24	110	510	2.4K	11K	51K	240K	1.1M	5.1M
1.2	5.6	27	120	560	2.7K	12K	56K	270K	1.2M	5.6M
1.3	6.2	30	130	620	3.0K	13K	62K	300K	1.3M	6.2M
1.5	6.8	33	150	680	3.3K	15K	68K	330K	1.5M	6.8M
1.6	7.5	36	160	750	3.6K	16K	75K	360K	1.6M	7.5M
1.8	8.2	39	180	820	3.9K	18K	82K	390K	1.8M	8.2M
2.0	9.1	43	200	910	4.3K	20K	91K	430K	2.0M	9.1M
2.2	10	47	220	1.0K	4.7K	22K	100K	470K	2.2M	10M
2.4	11	51	240	1.1K	5.1K	24K	110K	510K	2.4M	11M
2.7	12	56	270	1.2K	5.6K	27K	120K	560K	2.7M	12M
3.0	13	62	300	1.3K	6.2K	30K	130K	620K	3.0M	13M
3.3	15	68	330	1.5K	6.8K	33K	150K	680K	3.3M	15M
3.6	16	75	360	1.6K	7.5K	36K	160K	750K	3.6M	16M
3.9	18	82	390	1.8K	8.2K	39K	180K	820K	3.9M	18M
4.3	20	91	430	2.0K	9.1K	43K	200K	910K	4.3M	20M
										22M

HOW TO ORDER		PRICING	PRICE PER 100 SAME VALUE
1/4W	PART NO. RQ (VALUE) EXAMPLE: RQ2K	**.05 EACH** - minimum increments of 5 each per value	**$2.00**
1/2W	PART NO. RH (VALUE) EXAMPLE: RH2K	**.06 EACH** - minimum increments of 5 each per value	**$3.00**

1/4 watt resistor assortment kit — A must for any builders junk box

Kit contains 610 pieces. 10 pieces each of 61 values from 10Ω to 1mΩ

Sold seperately you would have to pay $30.50! Save $20.55

RK-610..$9.95

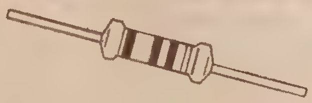
1WATT & 2 WATT RESISTORS

1 WATT 5% CARBON FILM

TABLE OF VALUES IN (OHMS)

0.5	10	180	3.2K	51K	300K	2.0M
1.0	12	220	3.3K	56K	330K	2.2M
1.2	15	270	3.9K	62K	360K	2.4M
1.5	18	330	4.7K	68K	390K	2.7M
1.8	22	390	5.6K	75K	430K	3.0M
2.2	27	430	6.8K	82K	470K	3.3M
2.4	33	470	8.2K	91K	510K	3.6M
2.7	39	560	10K	100K	560K	3.9M
3.3	47	620	12K	110K	620K	4.3M
3.6	56	680	15K	120K	680K	4.7M
3.9	68	820	16K	130K	750K	5.1M
4.7	82	910	18K	150K	820K	5.6M
5.6	100	1.0K	22K	160K	910K	6.2M
6.2	110	1.2K	27K	180K	1.0M	6.8M
6.8	120	1.5K	33K	200K	1.2M	7.5M
7.5	130	1.8K	39K	220K	1.5M	8.2M
8.2	150	2.2K	43K	240K	1.6M	9.1M
9.1	160	2.7K	47K	270K	1.8M	10M

PART NO.	1-99	100+
R1- (VALUE)	.20	.15



2 WATT METAL OXIDE

.1 OHM TO 6.8 OHM 5%
10 OHM TO 22M 2%

TABLE OF VALUES IN (OHMS)

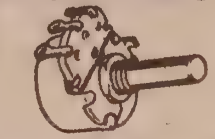
0.10	2.7	39	470	5.6K	68K	680K	9.1M
0.15	3.3	47	560	6.8K	82K	750K	10M
0.22	3.9	56	680	8.2K	100K	820K	12M
0.27	4.7	68	750	10K	120K	1.0M	15M
0.33	5.6	82	820	12K	130K	1.5M	18M
0.39	6.8	100	1.0K	15K	150K	2.2M	22M
0.47	10	120	1.5K	18K	180K	2.7M	
0.68	12	150	1.8K	22K	220K	3.3M	
0.82	15	180	2.2K	27K	270K	3.9M	
1.0	18	220	2.7K	33K	330K	4.7M	
1.5	22	270	3.3K	39K	390K	5.6M	
1.8	27	330	3.9K	47K	470K	6.8M	
2.2	33	390	4.7K	56K	560K	8.2M	

PART NO.	VALUE RANGE (ohms)	1-99	100+
RM2-(VALUE)	.10 to .15 OHMS	.60	.50
RM2-(VALUE)	.22 to 1M OHMS	.40	.30
RM2-(VALUE)	1.5M to 10M OHMS	.60	.50
RM2-(VALUE)	12M to 22M OHMS	.80	.70

POTENTIOMETERS

1/2 WATT STANDARD POTENTIOMETERS

Standard size potentiometer for use in most applications. Diameter is 24mm (approximately 15/16"). Mounting hole diameter 5/16". Round shaft. Solder leads.



LINEAR TAPER

Part No.	R-OHMS	PRICE EACH
P500	500	1.95
P1K	1K	1.95
P2K	2K	1.95
P5K	5K	1.95
P10K	10K	1.95
P50K	50K	1.95
P100K	100K	1.95
P500K	500K	1.95
P1M	1M	1.95

AUDIO TAPER

Part No.	R-OHMS	PRICE EACH
PA1K	1K	2.75
PA5K	5K	2.75
PA10K	10K	2.75
PA50K	50K	2.75
PA100K	100K	2.75
PA500K	500K	2.75
PA1M	1M	2.75

LINEAR TAPER with SPST Switch (1 Amp 250 Vac)

Part No.	R-OHMS	PRICE EACH
PS1K	1K	3.75
PS5K	5K	3.75
PS10K	10K	3.75
PS50K	50K	3.75
PS100K	100K	3.75
PS500K	500K	3.75
PS1M	1M	3.75

AUDIO TAPER with SPST Switch (1 Amp 250 Vac)

Part No.	R-OHMS	PRICE EACH
PAS1K	1K	3.75
PAS5K	5K	3.75
PAS10K	10K	3.75
PAS50K	50K	3.75
PAS100K	100K	3.75
PAS500K	500K	3.75
PAS1M	1M	3.75

1/4 WATT MINIATURE POTENTIOMETERS

Miniature potentiometer for use where a very small size is required. Only 16mm in diameter (approximatley 5/8"). Mounting hole 1/4". Round shaft. Solder leads.

LINEAR TAPER

Part No.	R-OHMS	PRICE EACH
PQ1K	1K	1.90
PQ2K	2K	1.90
PQ5K	5K	1.90
PQ10K	10K	1.90
PQ50K	50K	1.90
PQ100K	100K	1.90
PQ500K	500K	1.90
PQ1M	1M	1.90

AUDIO TAPER

Part No.	R-OHMS	PRICE EACH
PQA1K	1K	1.90
PQA5K	5K	1.90
PQA10K	10K	1.90
PQA50K	50K	1.90
PQA100K	100K	1.90
PQA500K	500K	1.90
PQA1M	1M	1.90

LINEAR TAPER with SPST Switch (1 Amp 250 Vac)

Part No.	R-OHMS	PRICE EACH
PQS1K	1K	2.95
PQS5K	5K	2.95
PQS10K	10K	2.95
PQS50K	50K	2.95
PQS100K	100K	2.95
PQS500K	500K	2.95
PQS1M	1M	2.95

AUDIO TAPER with SPST Switch (1 Amp 250 Vac)

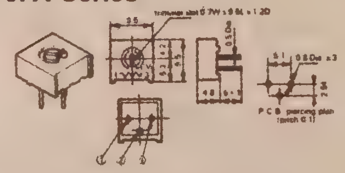
Part No.	R-OHM	PRICE EACH
PQAS1K	1K	2.95
PQAS5K	5K	2.95
PQAS10K	10K	2.95
PQAS50K	50K	2.95
PQAS100K	100K	2.95
PQAS500K	500K	2.95
PQAS1M	1M	2.95

TRIMMER POTENTIOMETERS

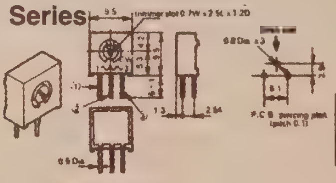
3/8" SQUARE SINGLE TURN

CERMET POTENTIOMETER

0FA Series



1FA Series



Specifications:

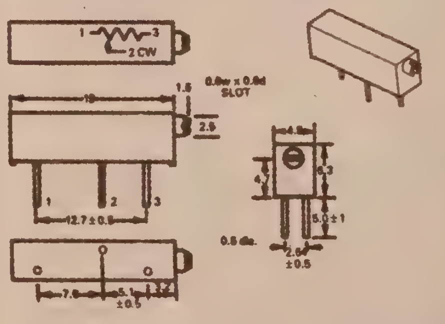
Resistance Range: 100Ω to 1MΩ
Tolerance: ± 10%
Taper: Linear
Residual Resistance: 3% Max
Wattage Rating: 0.5W (85°C)
Voltage Rating: 200V Max.
TCR: 100ppm/°C
CRV: 1% Max.
Rotation Torque: 360 gf. cm Max.
Stopper Strength: 500 gh. dm. Min.
Rotation Angel: 300° ± -10°
Operating Temperature: -55° to +125°C

Cross To	Bourns	Beckman	Spectrol
	3386	72	63P

PART NO. LAYDOWN VERSION TOP ADJUST	PART NO. STANDUP VERSION SIDE ADJUST	RESISTANCE VALUE OHMS	PRICE 1-99	PRICE 100+
0FA12	1FA12	100	1.50	1.30
1FA22	1FA22	200	1.50	1.30
0FA52	1FA52	500	1.50	1.30
0FA13	1FA13	1K	1.50	1.30
0FA23	1FA23	2K	1.50	1.30
0FA53	1FA53	5K	1.50	1.30
0FA14	1FA14	10K	1.50	1.30
0FA24	1FA24	20K	1.50	1.30
0FA54	1FA54	50K	1.50	1.30
0FA15	1FA15	100K	1.50	1.30
0FA25	1FA25	200K	1.50	1.30
0FA55	1FA55	500K	1.50	1.30
0FA16	1FA16	1M	1.50	1.30

15 TURN

3/4" RECTANGULAR CERMET POT



SPECIFICATIONS:

MECHANICAL CHARACTERISTICS:
Total adjustment turns: 15 ± 3 turns
Rotation torque: 360gf. cm max.
Mechanical stops: Wiper assembly idles
Terminal strength: 1kg. min.
Soldering: Within 3 sec. at 360°C

ELECTRICAL CHARACTERISTICS:
Resistance range: 100 ~1M
Tolerance: ± 10%
Power rating: 0.75W at 70°C derated to 0W at 125°
Maximum voltage: 300V
Residual resistance: 3% or Ω whichever is greater
Insulation Resistance: 1000MQ min. at DC 500V
Contact resistance version: 1% or 1Ω whichever is greater
Dielectric withstand voltage: 600V AC for one minute
Temperature coefficient: ± 100ppm/C°
Operating temperature range: -56° ~ +125°
Adjustability voltage: ± 0.02%
Residual resistance: 3% or 1Ω

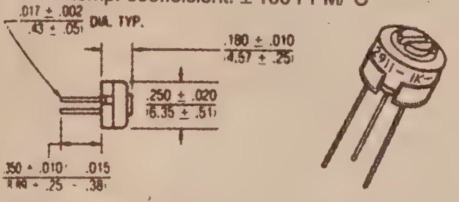
Cross To
Bourns 3006
Beckman 89PR
Spectrol 43P

PART NO.	OHMS	PRICE 1-99	PRICE 100+
01B12	100	1.60	1.40
01B22	200	1.60	1.40
01B52	500	1.60	1.40
01B13	1K	1.60	1.40
01B23	2K	1.60	1.40
01B53	5K	1.60	1.40
01B14	10K	1.60	1.40
01B24	20K	1.60	1.40
01B54	50K	1.60	1.40
01B15	100K	1.60	1.40
01B25	200K	1.60	1.40
01B55	500K	1.60	1.40
01B16	1M	1.60	1.40

TRIMMER POTENTIOMETERS

1/4" DIAMETER SINGLE TURN TOP ADJUST TRIM POT

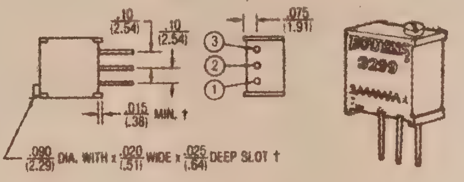
FEATURES
- 1/2 watt rating
- Small size, only 1/4" dia.
- Infinite resolution
- Cermet element
- Low temp. coeffeicient: ± 100 PPM/°C


.017 ± .002
(.43 ± .05) DIA. TYP.
.180 ± .010
(4.57 ± .25)
.250 ± .020
(6.35 ± .51)
.350 ± .010 .015
(8.89 ± .25 - .38)

PART NO.	OHMS	PRICE 1-99	100+
S0G12	100	2.25	1.98
S0G22	200	2.25	1.98
S0G52	500	2.25	1.98
S0G13	1K	2.25	1.98
S0G23	2K	2.25	1.98
S0G53	5K	2.25	1.98
S0G14	10K	2.25	1.98
S0G24	20K	2.25	1.98
S0G54	50K	2.25	1.98
S0G15	100K	2.25	1.98
S0G25	200K	2.25	1.98
S0G55	500K	2.25	1.98
S0G16	1M	2.25	1.98

3/8" SQUARE MULTI TURN TOP ADJUST CERMET POT

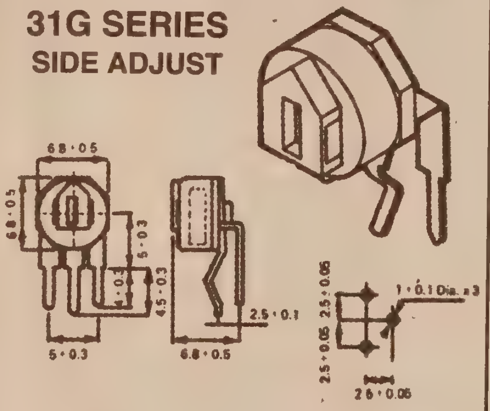
FEATURES
- 1/2 watt rating
- Low noise
- Infinite resolution
- Low temp. coeffeicient: ± 100 PPM/°C


.10
(2.54)
.10
(2.54)
.075
(1.91)
③
②
①
.015
(.38) MIN. †
.090
(2.29) DIA. WITH x .020
(.51) WIDE x .025
(.64) DEEP SLOT †
BOURNS
3299

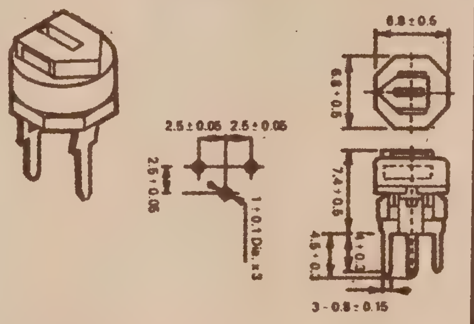
PART NO.	OHMS	PRICE 1-99	100+
3299W-101	100	2.60	2.30
3299W-501	500	2.60	2.30
3299W-102	1K	2.60	2.30
3299W-202	2K	2.60	2.30
3299W-502	5K	2.60	2.30
3299W-103	10K	2.60	2.30
3299W-203	20K	2.60	2.30
3299W-503	50K	2.60	2.30
3299W-104	100K	2.60	2.30
3299W-204	200K	2.60	2.30
3299W-504	500K	2.60	2.30
3299W-105	1M	2.60	2.30

6MM DIA. CERMET DUST PROOF TYPE

31G SERIES
SIDE ADJUST


6.8 · 0.5
6.8 · 0.5
5 · 0.3
4.5 · 0.3
5 · 0.3
6.8 · 0.5
2.5 · 0.1
1 · 0.1 Dia. x 3
2.5 · 0.05
2.5 · 0.05
2.5 · 0.05

36C SERIES
TOP ADJUST

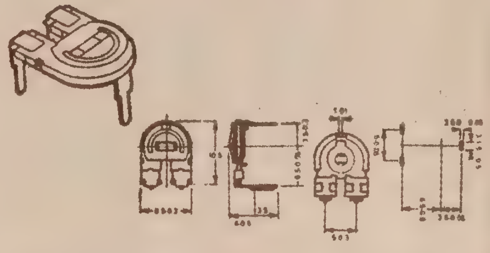

6.8 ± 0.5
6.8 ± 0.5
2.5 ± 0.05 2.5 ± 0.05
2.5 ± 0.05
1 ± 0.1 Dia. x 3
7.4 ± 0.5
4.5 ± 0.3
3 - 0.8 ± 0.15

PART NO. STANDUP VERSION BOTH SIDES ADJUST	PART NO. LAYDOWN VERSION TOP/BOTTOM ADJUST	RESISTANCE OHMS	PRICING 1-99	100+
31G12	36C12	100	.75	.65
31G22	36C22	200	.75	.65
31G52	36C52	500	.75	.65
31G13	36C13	1K	.75	.65
31G23	36C23	2K	.75	.65
31G53	36C53	5K	.75	.65
31G14	36C14	10K	.75	.65
31G24	36C24	20K	.75	.65
31G54	36C54	50K	.75	.65
31G15	36C15	100K	.75	.65
31G25	36C25	200K	.75	.65
31G55	36C55	500K	.75	.65
31G16	36C16	1M	.75	.65

ECONOMY TRIMMERS 8MM – AVAILABLE BOTH TOP ADJUST AND SIDE ADJUST

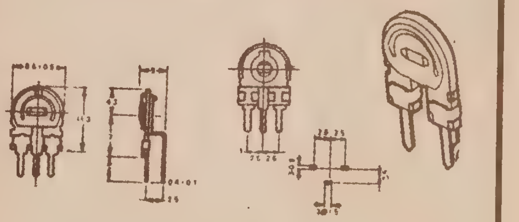
FEATURES
- .1 watt rating
- 200 WVDC
- linear taper
- wide resistance range

K4A Series TOP ADJUST



PART NO. LAYDOWN VERSION	RESISTANCE OHMS	PRICE 1-99	100+
K4A32	300	.50	.45
K4A52	500	.50	.45
K4A13	1K	.50	.45
K4A23	2K	.50	.45
K4A53	5K	.50	.45
K4A14	10K	.50	.45
K4A24	20K	.50	.45
K4A54	50K	.50	.45
K4A15	100K	.50	.45
K4A25	200K	.50	.45
K4A55	500K	.50	.45
K4A16	1M	.50	.45
K4A26	2M	.50	.45

K0A Series SIDE ADJUST



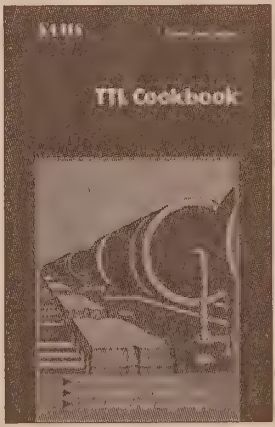
PART NO. LAYDOWN VERSION	RESISTANCE OHMS	PRICE 1-99	100+
K0A32	300	.50	.45
K0A52	500	.50	.45
K0A13	1K	.50	.45
K0A23	2K	.50	.45
K0A53	5K	.50	.45
K0A14	10K	.50	.45
K0A24	20K	.50	.45
K0A54	50K	.50	.45
K0A15	100K	.50	.45
K0A25	200K	.50	.45
K4A55	500K	.50	.45
K0A16	1M	.50	.45
K0A26	2M	.50	.45

TRANSISTOR TRANSISTOR LOGIC 7400 SERIES TRANSISTOR TRANSISTOR LOGIC

PART NO.	PINS	DESCRIPTION	PRICE
7400	14	QUAD 2-INPUT NAND GATE	.79
7401	14	QUAD 2-INPUT NAND GATE (OPEN COLLECTOR)	.59
7402	14	QUAD 2-INPUT NOR GATE	.59
7403	14	QUAD 2-INPUT NAND GATE (OPEN COLLECTOR)	.90
7404	14	HEX INVERTER	.59
7405	14	HEX INVERTER (OPEN COLLECTOR)	.49
7406	14	HEX INVERTER DRIVERS (30V O/C)	.49
7407	14	HEX DRIVER (30V O/C)	.59
7408	14	QUAD 2-INPUT AND GATE	.59
7409	14	QUAD 2-INPUT AND GATE (OPEN COLLECTOR)	2.60
7410	14	TRIPLE 3-INPUT NAND GATE	.39
7411	14	TRIPLE 3-INPUT AND GATE	3.95
7412	14	TRIPLE 3-INPUT NAND (OPEN COLLECTOR)	CALL
7413	14	DUAL 4-INPUT SCHMITT TRIG. NAND	.49
7414	14	HEX SCHMITT TRIGGER INVERTER	.49
7416	14	HEX INVERTING DRIVERS (15 O/V)	.39
7417	14	HEX DRIVERS (15 O/C)	.79
7420	14	DUAL 4-INPUT NAND GATE	.49
7421	14	DUAL 4-INPUT POSITIVE AND GATE	2.95
7422	14	DUAL 4-INPUT NAND GATE (OPEN COLLECTOR)	CALL
7423	16	EXPANDABLE DUAL 4-INPUT NOR GATE	2.80
7425	14	DUAL 4-INPUT NOR GATE W/STROBE	1.49
7426	14	QUAD 2-INPUT NAND GATE (15V 0/C)	1.95
7427	14	TRIPLE 3-INPUT NOR GATE	.59
7428	14	QUAD 2-INPUT NOR BUFFER	.59
7430	14	8-INPUT NAND GATE	.39
7432	14	QUAD 2-INPUT NOR GATE	.59
7437	14	QUAD 2-INPUT NAND BUFFER	3.70
7438	14	QUAD 2-INPUT NAND BUFFER (OPEN COLLECTOR)	.49
7440	14	DUAL 4-INPUT NAND BUFFER GATES	.39
7442	16	BCD-TO-DECIMAL DECODER	.99
7443	16	EXCESS-3 DECIMAL DECODER	3.70
7444	16	EXCESS-3-GRAY DECIMAL DECODER	3.70
7445	16	BCD-TO-DECIMAL DECODER/DRIVER	.99
7447	16	BCD-7-SEG. DECODER/DRIVER(15V)	1.49
7448	16	BCD TO 7-SEGMENT DECODER/DRIVER	CALL
7450	14	XPAN. DUAL 2-WIDE 2IN A-O-I GATE	3.25
7451	14	DUAL 2-WIDE 2-IN AND/OR INVERTER GATE	3.35
7453	14	XPAN. 4-WIDE 2IN AND/OR INVERTER	2.75
7454	14	4 WIDE 2-INPUT AND/OR INVERTER	2.25
7459	14	2 WIDE 2-3 IN AND/OR INVERTER GATE	3.65
7460	14	DUAL 4-INPUT EXPANDERS	3.65
7470	14	EDGE TRIGGERED JK FLIP FLOP	.59
7472	14	J-K MASTER SLAVE FLIP FLOP	.59
7473	14	DUAL D MASTER SLAVE FLIP FLOP	.99
7474	14	DUAL D FLIP FLOP POS. EDGE TRIG	.49
7475	16	QUAD BISTABLE LATCHES	2.95
7476	16	DUAL JK MASTER SLAVE FLIP FLOP	1.29
7479	14	DUAL D FLIP FLOP	CALL
7480	14	GATED FULL ADDER	2.80
7482	14	2-BIT FULL ADDER	CALL
7483	16	4-BIT BINARY FULL ADDER	.89
7485	16	4-BIT MAGNITUDE COMPARATOR	.49
7486	14	QUAD 2-INPUT EXCLUSIVE OR GATE	.79
7489	16	64-BIT RAM	2.95
7490	14	BCD DECADE COUNTER	.99
7491	14	8-BIT SHIFT REGISTER	3.75
7492	14	DIVIDE-BY-TWELVE COUNTER	1.29
7493	14	4-BIT BINARY COUNTER	1.29
7494	16	4-BIT SHIFT REG. PAR. IN/SER. OUT	CALL
7495	14	4-BIT RIGHT SHIFT LEFT SHIFT REG.	.69
7496	16	5-BIT PAR. IN PAR. OUTSHIFT REG.	.59
7497	16	6-BIT BINARY RATE MULTIPLIER	3.49

PART NO.	PINS	DESCRIPTION	PRICE
74104	14	GATED J-K MASTER SLAVE FLIP FLOP	CALL
74107	14	DUAL JK MASTERSLAVE FLIP FLOP	.49
74109	16	DUAL J-K POS-EDGE TRIGGERED F-F	.49
74121	14	MONOSTABLE MULTIVIBRATOR	.99
74122	14	RETRIGGERABLE MONOSTABLE MULTIVIBRATOR	.79
74123	16	DUAL RETRIG. MONOSTABLE MULTIVI.	.89
74125	14	TRI-STATE QUAD BUS BUFFER	.99
74126	14	TRI-STATE QUAD BUS BUFFER	.79
74132	14	QUAD SCHMITT TRIGGER	.69
74145	16	BCD-TO-DECIMAL DECODER/DRIVER	CALL
74148	16	8-TO-3 LINE PRIORITY ENCODER	.99
74150	24	16-LINE TO 1-LINE MULTIPLEXER	1.95
74151	16	1 OF 8 DATA SELECTOR/MULTIPLEXER	.49
74152	14	8-CHANNEL DATA SELECTOR	CALL
74153	16	DUAL 4/1 MULTIPLEXER	.49
74154	24	4-TO-16-LINE DECODER/DEMULTIPLEX	2.49
74155	16	DUAL 2/4 DEMULTIPLEXER	CALL
74156	16	DUAL 2/4 DEMULTIPLEXER (OPEN COLLECTOR)	3.79
74157	16	QUAD 2/1 DATA SELECTOR	.59
74158	16	QUAD 2/1 MULTIPLEXER (INV. OUT)	2.99
74159	24	4-TO-16-LINE DECODER/DEMULTIPLEXER	3.99
74160	16	SYNCH BCD DECADE COUNTER W/DIRECT CLEAR	.49
74161	16	SYNCHRONOUS 4-BIT COUNTER	.49
74162	16	SYNCH BCD DECADE COUNTER W/SYN. CLEAR	CALL
74163	16	SYNCHRONOUS 4-BIT BINARY COUNTER W/SYN.	.39
74164	14	8-BIT SERIAL-IN PARALLEL-OUT SHIFT REGISTER	.39
74165	16	8-BIT SERIAL/PARALLEL-IN SERIAL-OUT SHIFT REG.	.59
74166	16	8-BIT SERIAL/PARALLEL-IN SERIAL-OUT SHIFT REG.	2.79
74170	16	4 X 4 REGISTER FILE (O/C)	2.39
74173	16	4-BIT D-TYPE REGISTER TRI-STATE	2.19
74174	16	HEX D FLIP FLOP WITH CLEAR	.59
74175	16	QUAD D FLIP FLOP WITH CLEAR	.59
74177	14	PRESETTABLE 35-MHZ 4-BIT BINARY COUNTER	1.79
74180	14	8-BIT ODD/EVEN PARITY GENERATOR/CHECKER	.59
74181	24	ARITHMETIC LOGIC UNIT/FUNCTION GENERATOR	1.95
74182	16	LOOK-AHEAD CARRY GENERATOR	2.29
74191	16	SYNCHRONOUS 4-BIT BINARY UP/DOWN COUNTER	.99
74192	16	SYNCHRONOUS BCD DECADE UP/DOWN COUNTER	3.95
74193	16	SYNCHRONOUS 4-BIT BINARY UP/DOWN COUNTER	1.59
74194	16	4-BIT BIDIRECTIONAL SHIFT REGISTER	1.39
74195	16	4-BIT SERIAL/PARALLEL-IN PARRELLEL-OUT SHIFT REG.	.99
74197	14	PRESETTABLE 50-MHZ 4-BIT BINARY COUNTER	CALL
74221	16	DUAL MONOSTABLE MULTIVIBRATOR	.99
74247	16	BCD-7-SEGMENT DECODER/DRIVER	3.25
74251	16	1-OF-8 DATA SELECTOR/MULTIPLEXER	.99
74259	16	8-BIT ADDRESSABLE LATCH	1.99
74265	16	QUAD COMPLEMENTARY-OUTPUT ELEMENTS	CALL
74273	20	OCTAL D-TYPE FLIP FLOP WITH CLEAR	2.65
74276	20	QUAD J-K FLIP FLOP	1.95
74178	14	4-BIT CASCADABLE PRIORITY REGISTER	2.65
74279	16	QUAD S-R LATCHES	.99
74283	14	4-BIT BINARY FULL ADDERS W/FAST CARRY	CALL
74298	16	QUAD 2-INPUT MULTIPLEXER W/STORAGE	1.90
74365	16	TRI-STATE HEX BUFFER NON-INVERTING	.99
74366	16	HEX INVERTING BUS DRIVERS	.99
74367	16	HEX NON-INVERTING BUS DRIVERS: TRI-STATE	.79
74368	16	HEX INVERTING BUS DRIVERS (TRI-STATE)	CALL
74390	16	DUAL 4-BIT DECADE COUNTERS	1.49

ITEMS MARKED CALL ARE DISCONTINUED BUT LIMITED STOCK IS STILL ON HAND!



TTL COOKBOOK by DON LANCASTER

This bestselling book has become the standard reference to TTL devices. It tells what they are, how they work, and how to use them. The *TTL Cookbook* also covers TTL basics, a catalog of devices, logic, gates, flip flops, counters, shift registers, and rate multipliers. It is filled with circuits and practical applications to aid the user who wants to learn about and use TTL.

Don Lancaster heads Synergetics, a new-age design and consulting firm involved in microcomputer applications and electronic design. He is well known as the author of the classic Cookbook series, and has also written many other books and hundreds of articles on personal computing. 335 pages, paperback.

21035 .... $24.95

LOWER POWER SCHOTTKY

74LS SERIES

LOW POWER SCHOTTKY

The 74LS Series of Bipolar Digital integrated Circuits have been the workhorse of digital circuits for more than two decades and although improved alternatives such as the 74ALS and 74HCT Series are also available now, for general medium-frequency designs, the 74LS Series offer the advantage of lower cost over the 74ALS Series, and lower power consumption at near maximum operating frequencies over the 74HCT Series. Due to lower power consumption of 74HCT circuits at lower frequencies, total Fan-In/Fan-Out compatibility with the 74LS Series and its cost competitiveness, a 'mixed' circuit design employing 74HCT devices in lower frequency stages and 74LS components in higher frequency areas appears to be the optimum solution.

PART NO.	PINS	DESCRIPTION	PRICE
74LS00	14	QUAD 2-INPUT NAND GATE	.29
74LS02	14	QUAD 2-INPUT NOR GATE	.35
74LS03	14	QUAD 2-INPUT NAND GATE (OPEN COLLECTOR)	.35
75LS04	14	HEX INVERTER	.35
74LS05	14	HEX INVERTER (OPEN COLLECTOR)	.35
74LS08	14	QUAD 2-INPUT AND GATE	.29
74LS09	14	QUAD 2-INPUT AND GATE (OPEN COLLECTOR)	.29
75LS10	14	TRIPLE 3-INPUT NAND GATE	.29
74LS11	14	TRIPLE 3-INPUT AND GATE	.29
74LS12	14	3-INPUT NAND GATE (OPEN COLLECTOR)	.29
74LS13	14	DUAL SCHMITT TRIGGER	.49
74LS14	14	HEX SCHMITT TRIGGER	.39
74LS15	14	TRIPLE 3-INPUT AND GATE (O/C)	.39
74LS20	14	DUAL 4-INPUT NAND GATE	.29
74LS21	14	DUAL 4-INPUT AND GATE	.35
74LS22	14	DUAL 4-INPUT NAND GATE (OPEN COLLECTOR)	.39
74LS26	14	QUAD 2-INPUT NAND GATE (15V O/C)	.35
74LS27	14	TRIPLE 3-INPUT NOR GATE	.35
74LS28	14	QUAD 2-INPUT NOR BUFFER	.39
74LS30	14	8-INPUT NAND GATE	.29
74LS32	14	QUAD 2-INPUT OR GATE	.35
74LS33	14	QUAD 2-INPUT NOR BUFFER (OPEN COLLECTOR)	.49
74LS37	14	QUAD 2-INPUT NAND BUFFER	.39
74LS38	14	QUAD 2-INPUT NAND BUFFER (OPEN COLLECTOR)	.39
74LS40	14	DUAL 4-INPUT NAND BUFFER	.39
74LS42	16	BCD-TO-DECIMAL DECODER	.79
74LS47	16	BCD-7-SEGMENT DECODER/DRIVER	1.40
74LS51	14	DUAL 2-INPUT AND/OR INVERT GATE	CALL
74LS54	14	4 WIDE 2-INPUT AND/OR INVERT GATE	CALL
74LS55	14	2 WIDE 4-INPUT AND/OR INVERT GATE	CALL
74LS73	14	DUAL JK FLIP FLOP WITH CLEAR	.59
74LS74	14	DUAL D FLIP FLOP	.35
74LS75	16	QUAD BISTABLE LATCHES	.59
74LS76	16	DUAL JK FLIP FLOP	.79
74LS83	16	4-BIT BINARY FULL ADDER	.59
74LS85	16	4-BIT MAGNITUDE COMPARATOR	.59
74LS86	14	QUAD EXCLUSIVE OR GATE 2-INPUT	.35
74LS90	14	BCD DECADE COUNTER	.65
74LS91	14	8-BIT SHIFT REGISTER	CALL
74LS92	14	DIVIDE-BY-TWELVE COUNTER	.99
74LS93	14	4-BIT BINARY COUNTER	.99
74LS107	14	DUAL JK MASTER-SLAVE FLIP FLOP	.89
74LS109	16	DUAL JK POSITIVE EDGE FLIP FLOP	.45
74LS112	16	DUAL JK NEGATIVE EDGE FLIP FLOP	.39
74LS114	14	DUAL JK NEGATIVE EDGE FLIP FLOP	CALL
74LS122	14	RETRIGGERABLE MONOSTABLE MULTIVIBRATOR	.60
74LS123	16	MONOSTABLE MULTIVIBRATOR WITH CLEAR	.59
74LS125	14	TRI-STATE QUAD BUFFER	.49
74LS126	14	QUAD BUFFER (TRI-STATE)	.49
74LS132	14	QUAD SCHMITT TRIGGER	.49
74LS133	16	13-INPUT NAND GATE	.55
74LS136	14	QUAD 2-INPUT EXCLUSIVE OR GATE	.49
74LS137	16	3/8 LINE DECODER/DEMULTI W/ADD LATCHES	3.79
74LS138	16	EXPANDABLE 3/8 DECODER	.49
74LS139	16	EXPANDABLE DUAL 2/4 DECODER	.49
74LS145	16	BCD-TO-DECIMAL DECODER/DRIVER	.99
74LS147	16	10-LINE TO 4-LINE PRIORITY ENCODER	1.99
74LS148	16	8-LINE TO 3-LINE PRIORITY ENCODER	1.25
74LS151	16	1 OF 8 DATA SELECTOR MULTIPLEXER	.49
74LS152	14	1-OF-8 INVERTING DATA SEL./MUX	CALL
74LS153	16	DUAL 4-INPUT MULTIPLEXER	.49
74LS154	24	SINGLE 4-16 DECODER	2.95
74LS155	16	DUAL 2/4 DEMULTIPLEXER	.59
74LS156	16	DUAL 2/4 DEMULTIPLEXER (OPEN COLLECTOR)	.59
74LS157	16	QUAD 2/1 MULTIPLEXER	.45
74LS158	16	QUAD 2/1 MULTIPLEXER (INV. OUT)	CALL
74LS160	16	PRESETTABLE DECADE COUNTER	.99
74LS161	16	PRESETTABLE BINARY COUNTER	.49
74LS162	16	PRESETTABLE DECADE COUNTER WITH CLEAR	2.79
74LS163	16	PRESETTABLE BINARY COUNTER WITH CLEAR	.69
74LS164	14	8-BIT SHIFT REGISTER	.59
75LS165	16	PARALLEL LOAD 8-BIT SERIAL SHIFT REGISTER	.75
75LS166	16	8-BIT SHIFT REGISTER	.99
74LS168	16	SYNCH DECADE UP/DOWN COUNTER (74LS668)	CALL
74LS169	17	SYNCH BINARY UP/DOWN COUNTER (74LS669)	1.00
74LS170	16	4 X 4 REGISTER FILE	CALL
74LS173	16	QUAD D. REGISTER (IN-STATE)	.59
74LS174	16	HEX D FLIP FLOP WITH CLEAR	.49
74LS175	16	QUAD D FLIP FLOP	.49
74LS181	24	ARITHMETIC LOGIC UNIT	2.49
74LS190	16	UP/DOWN DECADE COUNTER	1.79
74LS191	16	UP/DOWN BINARY COUNTER	.59
74LS192	16	4-BIT UP/DOWN BCD COUNTER	CALL
74LS193	16	4-BIT UP/DOWN BINARY COUNTER	.79
74LS194	16	4-BIT DIRECTIONAL UNIVERSAL SHIFT REGISTER	.69
74LS195	16	4-BIT PARALLEL-ACCESS SHIFT REGISTER	.79
74LS196	14	PRESETTABLE DECADE COUNTER	CALL
74LS197	14	PRESET BINARY COUNTER	CALL
74LS221	16	DUAL ONE-SHOT	.69
74LS240	20	OCTAL INVERTER BUS/LINE DRIVER	.69
74LS241	20	20 OCTAL BUS/LINE DRIVER	.69
74LS242	14	QUAD BUS TRANSCEIVER INVERTING	2.49
74LS243	14	TRI-STATE QUAD TRANSCEIVER	.69
74LS244	20	OCTAL DRIVER NON-INVERTING TRI-STATE	.69
74LS245	20	OCTAL BUS TRANSCEIVER NON-INVERTING	.89
74LS247	16	BCD TO 7-SEGMENT DECODER/DRIVER	1.09
74LS248	16	BCD TO 7-SEGMENT DECODER/DRIVER	CALL
74LS251	16	TRI-STATE 8-CHANNEL MULTIPLEXER	.59
74LS253	16	DUAL 4-INPUT MULTIPLEXER TRI-STATE	CALL
74LS257	16	QUAD 3-INPUT MULTIPLEXER IN-STATE	.49
74LS258	16	QUAD 2/1 MULTIPLEXER	CALL
74LS259	16	8-BIT ADDRESSABLE LATCH	.99
74LS260	14	DUAL 5-INPUT NOR GATE	CALL
74LS266	14	QUAD EX-NOR GATE	.59
74LS273	20	8-BIT D TYPE REGISTER	.89
74LS279	16	QUAD S-R LATCHES	.49
74LS280	14	9-BIT ODD/EVEN PARITY GENERATOR/CHECKER	1.95
74LS283	16	4-BIT FULL ADDER	.69
74LS293	14	4-BIT BINARY COUNTER	CALL
74LS298	16	QUAD 2-INPUT MULTIPLEXER WITH STORAGE	.99
74LS299	20	8-BIT UNIVERSAL SHIFT/STORAGE REGISTER	2.99
74LS352	16	DUAL 4-BIT MULTIPLEXER (INV. OUT)	CALL
74LS353	16	DUAL 4-BIT MULTIPLEXER I(INV. OUT)	CALL
74LS365	16	HEX BUFFER (TRI-STATE)	.99
74LS366	16	HEX INVERTER (TRI-STATE)	.49
74LS367	16	HEX BUFFER (TRI-STATE)	.49
74LS368	16	HEX INVERTER (TRI-STATE)	CALL
74LS373	20	OCTAL TRANSPARENT LATCH	.79
74LS374	20	OCTAL DUAL FLIP FLOP (TRI-STATE)	.79
74LS375	16	QUAD LATCH	CALL
74LS377	16	OCTAL D-TYPE FLIP-FLOPS WITH COMMON ENABLE	.99
74LS378	16	HEX D-TYPE FLIP-FLOPS WITH COMMON ENABLE	CALL
74LS379	16	QUAD D-TYPE FLIP-FLOPS WITH COMMON ENABLE	CALL
74LS386	14	QUAD 2-INPUT EXCLUSIVE-OR GATES	CALL
74LS390	16	DUAL BCD DECADE COUNTERS	.89
74LS393	16	DUAL 4-BIT BINARY COUNTERS	.89
74LS395	16	4-BIT SERIAL/PARALLEL-IN PARALLEL-OUT S-R (3S)	CALL
74LS595	16	8-BIT SHIFT REGISTER WITH OUTPUT LATCHES	3.29
74LS640	20	OCTAL INVERTING BUS TRANSCEIVERS (3-S)	CALL
74LS645	20	OCTAL NON-INVERTING BUS TRANSCEIVERS (3-S)	2.79

ITEMS MARKED CALL HAVE BEEN DISCONTINUED BY THE MANUFACTURER.
HOWEVER WE STILL HAVE A LIMITED STOCK ON HAND.

CM0S 4000 SERIES CM0S

PART NO.	PINS	DESCRIPTION	PRICE
4001	14	QUAD 2-INPUT NOR GATES	.45
4007	14	DIAL COMPLIMENTARY PAIRS PLUS INVERTER	.49
4011	14	QUAD 2-INPUT NAND GATES	.39
4012	14	DUAL 4-IMPUT NAND GATES	.45
4013	14	DUAL D FLIP FLOP WITH SET/RESET	.49
4015	16	DUAL 4 STAGE STATIC SHIFT REGISTER	.61
4016	14	QUAD BILATERAL SWITCHES	.42
4017	16	DECADE COUNTER WITH 10 OUTPUTS	.61
4018	16	PRESETTABLE DIVIDE-BY-N COUNTER	.61
4019	16	QUAD AND-OR SELECT GATES	.50
4020	16	14 STAGE BINARY RIPPLE COUNTER	.65
4021	16	8 STAGE STATIC SHIFT REGISTER	.61
4022	16	OCTAL COUNTER WITH 8 OUTPUTS	.61
4023	14	TRIPLE 3-INPUT NAND GATES	.40
4024	14	7-STAGE BINARY COUNTER	.54
4025	14	TRIPLE 3-INPUT NOR GATES	.40
4027	16	DUAL J-K MASTER SLAVE FLIP FLOP	.43
4028	16	BCD TO DECIMAL DECODER	.57
4029	16	PRESETTABLE UP/DOWN COUNTER	.65
4032	16	TRIPLE POSITIVE LOGIC SERIAL ADDERS	CALL
4034	24	8-BIT BI-DIRECTIONAL SHIFT REGISTER	CALL
4035	16	4-STAGE PARALLEL IN/OUT SHIFT REGISTER	CALL
4038	16	TRIPLE NEGATIVE LOGIC SERIAL ADDERS	CALL
4040	16	12-STAGE BINARY/RIPPLE COUNTER	.65
4042	16	QUAD CLOCKED D-LATCH	.79
4043	16	QUAD NOR R-S LATCHES (3-S)	.60
4044	16	QUAD NAND R-S LATCHES (3-S)	.60
4046	16	MICROPOWER PHASE-LOCKED LOOP	.75
4047	14	MONOSTABLE/ASTABLE MULTIVIBRATOR	.79
4048	16	8-INPUT EXPANDABLE MULTIFUNTION GATE	CALL
4049	16	HEX INVERTING BUFFERS/CONVERTERS	.45
4050	16	HEX BUFFERS/CONVERTERS	.42
4051	16	8-CHANNEL MUX/DEMUX	.55
4052	16	DIFFERENTIAL 4-CHANNEL MULTIPLEXER	.55
4053	16	TRIPLE 2'CHANNEL MULTIPLEXER	.55
4054	16	4-SEGMENT LCD DRIVER	CALL
4055	16	BCD TO 7-SEGMENT DECODER LCD	3.79

PART NO.	PINS	DESCRIPTION	PRICE
4060	16	14-STAGE BINARY COUNTER W/OSC.	.75
4066	14	QUAD BILATERAL SWITCHES	.41
4067	24	16-CHANNEL ANALOG MUX/DEMUX	1.90
4068	14	8-INPUT NAND/AND GATE	1.49
4069	14	HEX INVERTERS	.39
4070	14	QUAD 2-INPUT EXCLUSIVE-OR GATES	.39
4071	14	QUAD 2-INPUT OR GATES	.49
4072	14	DUAL 4-INPUT OF GATES	.49
4075	14	TRIPLE 3-INPUT OR GATES	.45
4077	14	QUAD 2-INPUT EXCLUSIVE-NOR GATES	CALL
4078	14	8-INPUT NOR/OR GATES	CALL
4081	14	QUAD 2-INPUT AND GATES	.39
4093	14	QUAD 2-INPUT NAND SCHMITT TRIGGER	.43
4094	16	CASCADABLE 4-BIT BINARY RATE MULTIPLIER	.99
4098	16	DUAL MONOSTABLE MULTIVIBRATORS	.99
4099	16	8-BIT ADDRESSABLE LATCH	.85
4502	16	HEX STROBED INVERTING BUFFERS	1.79
4503	16	HEX BUFFERS (3-S)	.57
4508	24	DUAL 4-BIT LATCHERS	CALL
4510	16	BCD UP/DOWN COUNTER	.99
4511	16	BCD TO 7-SEGMENT LATCH/DECODER/DRIVER	.89
4512	16	8-CHANNEL DATA SELECTOR/MULTIPEXER	.68
4514	24	4-BIT LATCH/4-TO-16 LINE DECODER/DEMUX	1.43
4516	16	PRESETTABLE 4-BIT BINARY UP/DOWN COUNTER	.71
4518	16	DUAL BCD DECADE COUNTERS	.70
4520	16	DUAL 4-BIT BINARY COUNTERS	.68
4528	16	DUAL MONOSTABLE MULTIVIBRATOR	.69
4538	16	DUAL RETRIG. MONOSTABLE MULTIVIBRATOR	.88
4541	14	PROGRAMMABLE OSCILLATOR/TIMER	.88
4543	16	BCD TO 7-SEGMENT LATCH/DECODER/LCD DRIVER	.85
4556	16	DUAL BINARY TO 1-OF-4 DECODER/DEMUX	.65
4584	14	HEX SCHMITT TRIGGER	.69
40147	16	10-TO-4 BCD PRIORITY ENCODER	CALL
40160	16	SYNC. BCD DECADE COUNTER W/CLEAR	CALL
40161	16	SYNC 4-BIT BINARY COUNTER W/CLEAR	1.49
40162	16	SYNC. BCD DECADE COUNTER W/SYNC. CLEAR	CALL
40163	16	SYNC. 4-BIT BINARY COUNTER W/SYNC. CLEAR	CALL

VARACTOR DIODES (TUNING DIODES)

TUNING DIODES

The capacitance varies with voltage so you can use voltage change to tune an RF circuit inplace of using a (mechanical) variable capacitor. Current consumption is negligible.

The following values are the nominal capacitance value at 4 volts; capacitance varies with voltage.

MV2101	6.8pF	$1.10
MV2103	10pF	2.95
MV2105	15pF	1.10
MV2109	33pF	1.10

TUNING DIODE type MV 209 has a capacitance of 40pF @ 1.6 volts, 5pF @ 12 volts

MV209 .... $2.95

TUNING DIODE type MVAM109 has a capacitance of 450pF @ 1 volt and 30pF @ 9 volts. This is a good item for use in the AM broadcast band.

MVAM109 .... $2.95

MISCELLANEOUS IC'S

PART NO.	PINS	DESCRIPTION	PRICE
H11AA1	6	PHOTON OPTO COUPLER	.89
H11C3	6	SCR OUTPUT OPTOISOLATORS	1.35
MCT2	6	SC 50% CTR (1500V)	.49
MCT6	8	DUAL PHOTO TRANSISTOR (1500V)	1.10
4N26	6	PHOTO TRANSISTOR SC 50% CTR(1500V)	.49
4N28	6	PHOTO TRANSISTOR SC 50% CTR(500V)	.59
4N35	6	PHOTO TRANS. HIGH DC CTR (100%)(2500V)	.59
Z80A-CPU	40	4MHZ 8 BIT MICROPROCESSOR	4.95
Z80B-CPU	40	6MHZ 8 BIT MICROPROCESSOR	6.95
Z80A-DMA	40	4MHZ DIRECT MEMORY ACCESS CONTROLLER	7.95
Z80A-SIO/0	40	4MHZ SERIAL INPUT/OUTPUT CONTROLLER	4.95
Z80A-DART	40	4MHZ DUAL ASYNCHRONOUS RECVR/TRANS.	6.95
2708	24	450 nS 8K-BIT (1K x8)	7.95
2716	24	450 nS 16K-BIT (2K x 8)	5.95
2732	24	450 nS 32K-BIT (4K x 8)	8.95
27128	28	250 nS 128K-BIT (16K x 8)	6.95
27256	28	250 nS 256K-BIT (32K x 8)	5.75
27C256-20	28	200 nS 256K-BIT (32K x 8)	6.95
27C512-15	28	150 nS 512K-BIT (64K x 8)	8.95

PART NO.	PINS	DESCRIPTION	PRICE
N82S141F	24	PROM (512 x 8) 60ns	9.95
18CV8PC-25	20	CMOS PEEL	4.95
PAL16L8	20	PAL AND-OR-INVERT	2.49
6551	28	ASYNCH. COMM. INTERFACE ADAPTER	7.95
6800	40	1 MHZ 8-BIT MICRO-PROCESSOR UNIT	6.95
68A00	40	1.5 MHZ 8-BIT MICRO-PROCESSOR UNIT	8.95
6802	40	8 BIT MPU WITH CLOCK & RAM (1MHZ)	7.95
6808	40	8 BIT MPU W/CLOCK	11.95
6810	24	450 nS 128-BIT (128 x 1) STATIC RAM	4.95
6820	40	1MHZ PERIPHERAL INTERFACE ADAPTER	10.95
6821	40	1MHZ PERIPHERAL INTERFACE ADAPTER	5.95
6840	28	1MHZ PROGRAMMABLE TIMER MODULE	5.95
6850	24	1 MHZ ASYNCH. COMM. INTERFACE ADAPTER	4.95
KM62256BLP-10	28	SRAM (32K x 8)	9.95
MCM60L256AP10	28	CMOS EPROM	9.95
4116	16	16K x 1 RAM (150ns)	1.49

We stock thousands of IC's not listed in our catalog. Types include 74HC, 74HCT, 74F, 74C, EPROMS, DTL, OPTO Isolators, PAL's, Microprocessors and more. Many obsolete and hard to find types. Please visit our website at: www.oselectronics.com to see a list of these devices.

DIODES AND BRIDGE RECTIFIERS

ZENER DIODES

400 mW 5%

D0-35

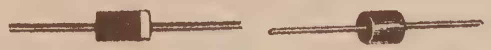
PART NO.	VOLTAGE	1-99	100+	PART NO.	VOLTAGE	1-99	100+
1N746	3.3	.25	.20	1N758	10	.25	.20
1N747	3.6	.25	.20	1N962	11	.25	.20
1N748	3.9	.25	.20	1N759	12	.25	.20
1N749	4.3	.25	.20	1N964	13	.25	.20
1N750	4.7	.25	.20	1N965	15	.25	.20
1N751	5.1	.25	.20	1N966	16	.25	.20
1N752	5.6	.25	.20	1N967	18	.25	.20
1N753	6.2	.25	.20	1N968	20	.25	.20
1N754	6.8	.25	.20	1N971	27	.25	.20
1N755	7.5	.25	.20	1N972	30	.25	.20
1N756	8.2	.25	.20	1N973	33	.25	.20
1N757	9.1	.25	.20	1N977	47	.25	.20

1W 5%

D0-41

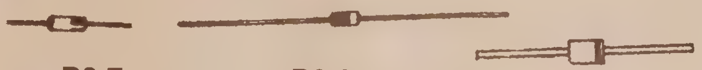
PART NO.	VOLTAGE	1-99	100+	PART NO.	VOLTAGE	1-99	100+
1N4728	3.3	.30	.25	1N4743	13	.30	.25
1N4729	3.6	.30	.25	1N4744	15	.30	.25
1N4730	3.9	.30	.25	1N4745	16	.30	.25
1N4731	4.3	.30	.25	1N4746	18	.30	.25
1N4732	4.7	.30	.25	1N4747	20	.30	.25
1N4733	5.1	.30	.25	1N4748	22	.30	.25
1N4734	5.6	.30	.25	1N4749	24	.30	.25
1N4735	6.2	.30	.25	1N4750	27	.30	.25
1N4736	6.8	.30	.25	1N4752	33	.30	.25
1N4737	7.5	.30	.25	1N4753	36	.30	.25
1N4738	8.2	.30	.25	1N4754	39	.30	.25
1N4739	9.1	.30	.25	1N4756	47	.30	.25
1N4740	10	.30	.25	1N4758	56	.30	.25
1N4741	11	.30	.25	1N4760	68	.30	.25
1N4742	12	.30	.25	1N4764	100	.30	.25

RECTIFIER DIODES



D0-41 D0-201 R-6

PART NO.	CASE	DESCRIPTION	1-99	100+
1N4001	D0-41	1 AMP 50 PRV	.10	.06
1N4002	D0-41	1 AMP 100 PRV	.10	.06
1N4003	D0-41	1 AMP 200 PRV	.10	.06
1N4004	D0-41	1 AMP 400 PRV	.11	.07
1N4005	D0-41	1 AMP 600 PRV	.12	.08
1N4006	D0-41	1 AMP 800 PRV	.13	.09
1N4007	D0-41	1 AMP 1000 PRV	.14	.10
1N5400	D0-201	3 AMP 50 PRV	.22	.17
1N5401	D0-201	3 AMP 100 PRV	.23	.18
1N5402	D0-201	3 AMP 200 PRV	.24	.19
1N5404	D0-201	3 AMP 400 PRV	.25	.20
1N5406	D0-201	3 AMP 600 PRV	.28	.27
1N5407	D0-201	3 AMP 800 PRV	.29	.22
1N5408	D0-201	3 AMP 1000 PRV	.30	.29
6A05	R-6	6 AMP 50PRV	.70	.50
6A1	R-6	6 AMP 100PRV	.80	.55
6A2	R-6	6 AMP 200PRV	.85	.65
6A4	R-6	6 AMP 400PRV	.95	.70
6A6	R-6	6 AMP 600PRV	1.00	.75
6A8	R-6	6 AMP 800PRV	1.00	.75
6A10	R-6	6 AMP 1000PRV	1.00	.75



D0-7 D0-35 D0-27

SWITCHING DIODES

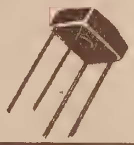
PART NO.	CASE	DESCRIPTION	1-99	100+	1000
1N914	D0-35	75V PRV 10MA	.10	.05	.03
1N4148	D0-35	75V PRV 10MA	.10	.05	.03

GERMANIUM DIODES

PART NO.	CASE	DESCRIPTION	1-99	100+
1N34A	D0-7	100V PRV 200MA	.40	.30
1N60	D0-7	400V PRV 50MA	.40	.30
1N270	D0-7	100V PRV 200MA	.65	.55
1N3600	D0-35	50V PRV 200MA	.35	.25

SCHOTTKY BARRIER RECTIFIERS

PART NO.	CASE	DESCRIPTION	1-99	100+
1N5820	D0-27	20 V PRV 3A	.75	.50
1N5821	D0-27	30 V PRV 3A	.75	.50
1N5822	D0-27	40 V PRV 3A	.75	.50

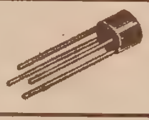


2, 6, AND 10 AMP .6" SQUARE BRIDGE RECTIFIERS

PART NO.	I MAX	V MAX	PRICE 1-99	100+
DB300	2	50	.70	.60
DB301	2	100	.72	.62
DB302	2	200	.74	.64
DB304	2	400	.80	.70
DB306	2	600	.84	.74
DB308	2	800	.90	.80
DB310	2	1000	.98	.88
DB600	6	50	1.38	1.28
DB601	6	100	1.44	1.34
DB602	6	200	1.52	1.42
DB604	6	400	1.62	1.52
DB606	6	600	1.66	1.56
DB608	6	800	1.92	1.82
DB610	6	1000	2.08	1.98
DB1000	10	50	2.48	2.38
DB1001	10	100	2.64	2.54
DB1002	10	200	2.70	2.60
DB1004	10	400	2.80	2.70
DB1006	10	600	3.05	2.95
DB1008	10	800	3.26	3.16
DB1010	10	1000	3.60	3.50

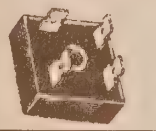
1AMP DIP BRIDGE RECTIFIERS

PART NO.	V MAX	PRICE 1-99	100+
VM08	50	.65	.58
VM18	100	.67	.58
VM28	200	.73	.66
VM48	400	.79	.68
VM68	600	.82	.73
VM88	800	.88	.76
VM108	1000	.99	.88



2 AMP BRIDGE RECTIFIERS

PART NO.	V MAX	PRICE 1-99	100+
RC201	50	.75	.65
RC202	100	.80	.70
RC203	200	.85	.75
RC204	400	.90	.80
RC205	600	.95	.85
RC206	800	1.00	.90
RC207	1000	1.05	.95



15,25 AND 35 AMP SQUARE BRIDGE RECTIFIERS

PART NO.	I MAX	V MAX	PRICE 1-99	100+
KBPC15005	15	50	3.40	2.90
KBPC1501	15	100	3.60	3.10
KBPC1502	15	200	3.80	3.30
KBPC1504	15	400	4.00	3.50
KBPC1506	15	600	4.20	3.70
KBPC1508	15	800	4.40	3.90
KBPC15010	15	1000	4.60	4.10
KBPC25005	25	50	3.60	3.10
KBPC2501	25	100	3.80	3.30
KBPC2502	25	200	4.00	3.50
KBPC2504	25	400	4.20	3.70
KBPC2506	25	600	4.40	3.90
KBPC2508	25	800	4.60	4.10
KBPC25010	25	1000	4.80	4.30
KBPC35005	35	50	5.90	5.40
KBPC3501	35	100	6.20	5.70
KBPC3502	35	200	6.50	6.00
KBPC3504	35	400	6.80	6.30
KBPC3506	35	600	7.10	6.60
KBPC3508	35	800	7.40	6.90
KBPC35010	35	1000	7.70	7.20

LINEAR IC'S

PART NO.	PINS	DESCRIPTION	PRICE
LM10CLN	8	LOW VOLTAGE (1.1V) OP AMP	3.75
TL062CN	8	LOW POWER JFET OP AMP	.69
TL071CN	8	LOW NOISE J-FET OP-AMP	.99
TLO72CN	8	LOW NOISE BIFET OP AMP	.99
TL074CN	8	LOW NOISE J-FET QUAD OP-AMP	1.49
TL080CP	8	BIMOS OP AMP	CALL
TL081CP	8	BIMOS OP AMP	.89
TL082CN	8	DUAL BIMOS OP AMP	.49
TL084CN	14	QUAD BIMOS OP AMP	1.69
MAX232CPE	16	DUAL RS232 RECEIVER/TRANSMITTER	2.95
L298N	SIP-15	DUAL BRIDGE DRIVER	3.15
LM301A	8	GENERAL PURPOSE OP AMP	.50
LM308N	8	MICRO POWER OP AMP	3.95
LM311N	8	VOLTAGE COMPARATOR	.56
LM317T	T0-220	ADJUSTABEL 1.5V-37V 1.5A	.99
LM318N	8	PRECISION HIGH SPEED OP-AMP	1.69
LM319N	14	DUAL COMP. HI-SPEED OP-AMP	1.49
XR320CP	14	PRECISION TIMER	CALL
LM324N	14	QUAD OP AMP	.52
LM334Z	T0-92	ADJ. CURRENT SOURCE	1.99
LM335Z	T0-92	PRECISION TEMP. SENSOR	2.19
LM336Z	T0-92	VOLTAGE REF. (2.5V)	1.39
LM337T	T0-220	ADJ. NEG. REG. 1.5A(-1.2-37V)	1.99
LM338K	T0-3	ADJ. POS. REG. 5A(1.2-32V)	4.95
LM339N	14	QUAD VOLTAGE COMPARATOR	.50
LF347N	14	QUAD J-FET INPUT OP-AMP (WIDE BAND)	1.49
LM351N	8	BI-FET OP AMP	.79
LF353N	8	DIAL FIFET OP AMP	.99
LF356N	8	J-FET INPUT OP AMP	1.09
LF357N	8	MONO JFET INPUT OP AMP	1.95
LM358N	8	DUAL LOW POWER OP AMPS	.79
LM359N	14	DUAL HIGH SPEED NORTON AMP	CALL
LM380N	14	2 WATT AUDIO PWR AMP	1.35
LM384N	14	5 WATT AUDIO AMP	2.25
LM386N	8	AUDIO AMPLIFIER 500MW, 8OHM LOAD	.99
ZN414	T0-92	SINGLE CHIP AM RADIO	9.95
NE555	8	PRECISION TIMER	.45
TLC555	8	LOW POWER CMOS 555 TIMER	.79
LM556N	14	DUAL 555 TIMER	.79
NE558N	16	QUAD TIMER	1.09
NE564N	16	DIGITAL PHASE LOCKED LOOP	2.95
LM565N	14	PHASED LOCKED LOOP	3.49
NE567N	8	TONE DECODER	.99
NE592N	14	DIFF. VIDEO AMP	.99
NE602AN	8	BAL MIX/OSC (SA602AN)	2.49
LM709N	8	HIGH PERFORMANCE OP AMP	CALL
UA 711N	14	DUAL DIFFERENTIAL COMPARATORS	2.79
UA723N	14	PRECISION V-REGULATOR	.65
UA733N	14	VIDEO AMPLIFIER	.99
LM739N	14	DUAL HI PERF. OP AMP	CALL
UA741N	8	FREQ. COMPENSATED OP AMP	.35
LM747N	14	DUAL 741 OP AMP	3.95
UA748N	8	HIGH PERFORMANCE OP AMP	CALL
MC13142	16	DC-1800 MHz LNA MIXER/VCO (Surface Mt)	10.95
MC13175	16	UHF FM/AM TRANSMITTER (Surface Mt)	14.95
MC1350P	8	VIDEO IF AMP (12V)	1.69
BA1404	18	FM STEREO TRANSMITTER	6.95
MC145436	14	DTMF TOUCHTONE DECODER	7.95
MC1458	8	DUAL COMPENSATED OP AMPS	.59
MC1488	16	QUAD RS-232 DRIVERS	.69
MC1489	14	QUAD RS-232 RECEIVERS	.69
MC1496N	14	DOUBLE BAL MOD/DEMOD	.99
TDA1514	9	50 WATT AUDIO AMPLIFIER	11.95
TDA1524	18	STEREO TONE/VOLUME/BALANCE	12.95
TDA1554	17	22 WATT STEREO AMPLIFIER	10.95
MC1558	8	DUAL COMPENSATED OP AMPS	CALL
LM1875T	T0-220	20 WATT POWER AUDIO AMPLIFIER	4.95
LM1889	18	TV VIDEO MODULATOR	CALL
ULN2429N	14	FLUID/MOISTURE DETECTOR	8.95
MC2833	16	FM TRANSMITTER	6.95
CD22402E	24	CMOS LSI SYNC GENERATOR	CALL
CA3018	T0-5	GENERAL PURPOSE TRANSISTOR ARRAY	CALL
CA3019	T0-5	ULTRA FAST LOW CAPACITANCE DIODE ARRAY	CALL
CA3039	T0-5	ULTRA FAST LOW CAPACITANCE DIODE ARRAY	CALL
CA3046	14	GP NPN TRANSISTOR ARRAY	.94
CA3053	T0-5	DIFFERENTIAL/CASCADE AMPLIFIER	CALL
CA3054	14	DUAL INDEPENDENT DIFF. AMPS.	1.99
CA3060	16	TRIPLE TRANSCONDUCTANCE AMPLIFIERS	3.49
CA3065	14	IF AMP,FM DETECTOR	CALL
CA3080E	8	OPERATIONAL TRANSCONDUCANCE AMPLIFIER	1.43
CA3093	8	DIODE, ZENER, NPN TRANSISTOR ARRAY	CALL
CA3097	16	ZENER, PUT, SCR, NPN, PNP, ARRAY	CALL
CA3102	14	DUAL HIGH-FREQ. DIFF. AMPLIFIERS	CALL
CA3126E	16	TV CHROMA PROCESSOR	CALL
CA3127E	16	HIGH FREQ NPN TRANSISTOR ARRAY	CALL
UGN3130	TO 92	HALL EFFECT SWITCH	2.95
CA3130E	8	BIMOS OP AMP	CALL
CA3138	14	HIGH-BETA NPN TRANSISTOR ARRAY	CALL
CA3140E	8	BIMOS OP AMP	1.89
CA3146E	14	HIGH-VOLTAGE TRANSISTOR ARRAY	3.79
CA3183E	16	HIGH VOLTAGE TRANSISTOR ARRAY	3.75
CA3193	8	BIMOS PRECISION OP AMP	3.79
CA3240A	14	DUAL BIMOS OP AMP	CALL
CA3280	16	DUAL VARIABLE OP AMPS	CALL
CA3290	8	DUAL BIMOS VOLTAGE COMPARATORS	CALL
MC33171	8	OP AMP	2.49
MC33172	8	QUAD OP AMP	2.49
MC3357P	16	RCVR SYST W/ SQUELCH/SCAN CONTROL	2.80
MC3362	24	FM DUAL CONVERSION RECEIVER	9.95
CA3401E	14	OP AMP	CALL
LM3900N	14	QUAD OP-AMP	.79
LM3909	8	LED FLASHER	CALL
LM3914N	18	BAR GRAPH DISPLAY DRIVER	CALL
NE5532N	8	DUAL LOW NOISE OP AMP	1.09
TEA5710	24	AM/FM RADIO RECIEVER	12.95
SA602AN	8	BAL MIX/0SC (NE602AN)	2.49
TDA7000	18	SINGLE CHIP FM RECEIVER	9.95

ITEMS MARKED CALL HAVE BEEN DISCONTINUED BY THE MANUFACTURER, HOWEVER WE STILL HAVE SOME STOCK ON HAND.

CALL OR E-MAIL FOR CURRENT PRICING.

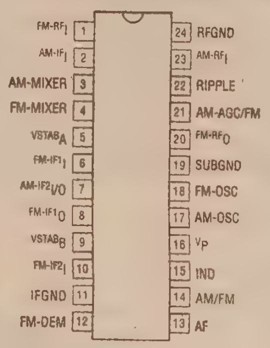
LINEAR V-REG'S, FIXED VOLTS

PART NO.	CASE STYLE	DESCRIPTION	PRICE
7805	T0-220	5 VOLT 1 AMP	.59
7805CK	T0-3	5 VOLT 1.5 AMP	2.75
7806	T0-220	6 VOLT 1 AMP	1.99
7806CK	T0-3	6 VOLT 1.5AMP	3.25
7807	T0-220	7 VOLT 1 AMP	1.99
7808	T0-220	8 VOLT 1 AMP	.99
7809	T0-220	9 VOLT 1 AMP	.99
7812	T0-220	12 VOLT 1 AMP	.59
7812CK	T0-3	12 VOLT 1.5A	2.75
7815	T0-220	15 VOLT 1 AMP	.59
7815CK	T0-3	15 VOLT 1.5 AMP	2.75
7818	T0-220	18 VOLT 1 AMP	.59
7820	T0-220	20 VOLT 1 AMP	.59
7824	T0-220	24 VOLT 1 AMP	.59
78L05	T0-92	5 VOLT 100MA	.59
78L08	T0-92	8 VOLT 100MA	.59
78L12	T0-92	12 VOLT 100MA	.59
78L15	T0-92	15 VOLT 100MA	.59
7905CV	T0-220	-5 VOLT, 1.5 AMP	.75
7905K	T0-3	-5 VOLT 1 AMP	3.79
7906K	T0-3	-6 VOLT 1 AMP	4.59
7908CV	T0-220	-8 VOLT, 1.5 AMP	.75
7912CV	T0-220	-12 VOLT, 1.5 AMP	.75
7912K	T0-3	-12 VOLT 1 AMP	3.79
7915CV	T0-220	-15 VOLT, 1.5 AMP	.75
7915K	T0-3	-15 VOLT 1 AMP	3.79
7918CV	T0-220	-18 VOLT, 1.5 AMP	.75
7920CV	T0-220	-20 VOLT, 1.5 AMP	.75
7924CV	T0-220	-24 VOLT, 1.5 AMP	.75
7924K	T0-3	-24 VOLT 1 AMP	4.59
79L05	T0-92	-5 VOLT 100MA	.59
79L12	T0-92	-12 VOLT 100MA	.59
79L15	T0-92	-15 VOLT 100MA	.59

SPECIALTY IC'S FOR THE EXPERIMENTER

An interesting selection of IC's for the experimenter, hobbyist, inventor or amateur radio operator. Spec sheets can be downloaded from our website www.oselectronics.com or purchase our component part databook sold below.

AM/FM RADIO RECEIVER CIRCUIT



This high performance radio receiver circuit has the functions necessary for AM/FM radio operation from the front-end to the detector output stages on one chip, including an onboard LED driver for tuning indication. Features include large signal handling of 300mV at AM and 500mV at FM, RF sensitivity of about 55µV for AM and 2.0µV for FM, high selectivity with distributed IF gain, and good AF output of 45mV in AM and 65mV in FM. 24 pin dip package.

A detailed 25 page data sheet with sample circuits can be downloaded from our website.

TEA5710 .... **$12.95**

Low-power DUAL CONVERSION FM RECEIVER IC

(Type MC3362)

Ideal for hi-frequency SSB and CW receivers. Includes dual FM conversions with oscillators, mixers, quadrature discriminator and carrier detect circuitry. 24 pin dip.

MC3362 .... **$9.95**

VHF DOUBLE BALANCED MIXER IC (Type SA602AN)

This is an extremely flexible low power IF mixer. Noise is under 5.0 dB @ 45MHz; excellent gain and sensitivity. Useful in direct conversion receivers or mixer/oscillator applications, portable radios, VHF transceivers etc. etc.. 8 pin dip.

SA602AN **$2.49**

FUNCTION GENERATOR IC

(Type ICL8038)

Provides simultaneous square, triangle and sine waveforms from .001 Hz to 1 megahertz. Operates at 10 to 36 volts DC; duty cycle adjustable from 2% to 98% and can also be used for frequency sweeping or FM modulated. 14 pin dip.

ICL8038 .... **$4.95**

HALL EFFECT SWITCH

(Type UGN3130)

A tiny, 3-lead device that can be a switch with no moving parts. Turns ON or OFF in the presence or absence of a magnetic field. Operates from 4.5 to 16 Volts DC; can drive CMOS or TTL logic. Useful for measuring RPM's, door or window opening, cycle counts etc... you furnish the magnet.

UGN3130 .... **$2.95**

AM RADIO RECEIVER on a CHIP

(Type ZN414Z)

In a tiny (to-92) transistor size case, a ten transistor tuned RF circuit that requires no setup or alignment. Nearly a complete circuit; add battery (1.1 to 1.6 volts), tuning coil and capacitor and crystal earphone.

ZN414 .... **$9.95**

TOUCH-TONE DECODER IC

(Type MC145436P)

Operates from a single +5 VDC supply to decode dual tones that comply with the DTMF standard, and outputs the appropriate hexadecimal response. This is a direct replacement for SSI-204. 14 pin dip.

MC145436P **$7.95**

Low-power AUDIO AMPLIFIER IC

(Type MC34119P)

A low power amp that may be used with two to six volts DC. Drives an 8 ohm speaker and up, maximum output power is 1/4 watt. Adjustable gain up to 46db, minimal external parts required. This IC is very useful in small, portable battery-powered circuits. 8 pin dip.

MC34119P **$2.95**

MOISTURE DETECTOR IC

(Type ULN2429N)

For an alarm to detect the presence or absence of moisture (water or other conductive fluids). Operates from 10 to 16 volts DC, optional AC or DC output. 14 pin dip.

ULN2429N **$8.95**

Low-power FM TRANSMITTER

(type MC2833)

FM transmitter for communications equipment. Includes audio (mike) preamp, VCO and 2 auxiliary transistors for frequency multiplication. Standard broadcast (88-108) band or on 2 meters. Circuit included. 16 pin dip.

MC2833 .... **$6.95**

STEREO TONE, VOLUME & BALANCE CONTROL IC

(type TDA1524)

Active balance, volume, bass and treble control for audio systems. All fuctions may be controlled by single, non-critical potentiometer. 18 pin dip.

TDA1524 .... **$12.95**

COMPONENT PART DATA BOOK

Ideal for the expermenter, builder, hobbist, or engineer. Detailed technical information and circuit examples for the semiconductors shown. (TEA5710 NOT LITED).

Soft cover, 8" x 11", 148 pgs.

21-8586 .... **$2.95**

HOT CARRIER DIODE

(Type MBD101)

Designed for UHF mixer applications, suitable for detector and ultra-fast switching circuits. Rugged, Schottky barrier construction.

MBD101 .... **$2.10**

FM RADIO IC TDA7000

Ideal for small mono FM receivers. Features an RF input stage, mixer, LO, IF amp/limiter stage, phase demodulator and muting circuitry. Also useful in LAN, data and SCA receivers. 18 pin dip.

TDA7000 .... **$9.95**

FM STEREO TRANSMITTER

(type BA1404)

Transmits both left and right channels to an FM radio (88 to 108 MHz); build a miniature FM broadcast station with this IC. 18 pin dip.

BA1404 .... **$6.95**

UHF-VHF TRANSMITTER

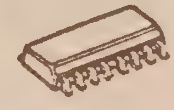
(type MC13175)

Single chip AM/FM transmitter designed for use at 50-470 MHz. Includes crystal ref oscillator, divide by 8 prescaler & phase detector. Operated from 1.8 to 5V DC, useful for AM, FM & video transmitters. Surface mount.

MC13175 .... **$14.95**

DC to 1.8 GHz LNA-MIXER-VCO

(Type MC13142)



From DC to 1.8 GHz low noise and high gain at low power. Consists for a Low Noise Amplifier, VCO, Buffered Oscillator output, mixer, IF amp with DC control sections. May also be used as an upconverter and exciter amplifier. Surface mount.

MC13142 .... **$10.95**

OP AMP

(Type MC33171)

A single OpAmp optimized for single supply operation. The MC33171 has a lower power, wide bandwidth at 1.8MHz. Especially useful in low power circuits and modern PLL circuits; with provisions for offset nulling if required. Wide supply range, from 3V to 44V operation. 8 pin dip.

MC33171 .... **$2.49**

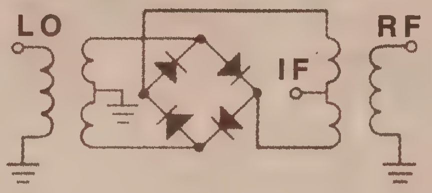
DUAL OP AMP

(Type MC33172)

This is the Quad version of the MC33171 OpAmp and will operate from a single supply, which is probably its most important feature. This is a good low power unit with a wide bandwidth. Use with 3V to 44V. 8 pin dip.

MC33172 .... **$2.49**

MINI-CIRCUITS MIXERS, AMPLIFIERS, & ATTENUATORS



DEFINITION OF A MIXER: A passive mixer where F1 is introduced at one port while F2 is introduced at the second port. These frequencies are then mixed with the result that F1 + F2 and F2 - F1 appear at the output port. We select the one we are looking for and discard the other. The important feature is the mixer, because of the balance of hot carrier diodes and transmission line transformes cancels even harmonics of both the R.F. input (port 1) and L.O. frequencies (port 2) and provides isolation among ports.

DETAIL SPECIFICATIONS AND APPLICATION NOTES CAN BE DOWN LOADED FROM MINI CIRCUITS: www.minicircuits.com

MINI-CIRCUITS BALANCED FREQUENCY MIXERS SBL-1 AND SBL-1X

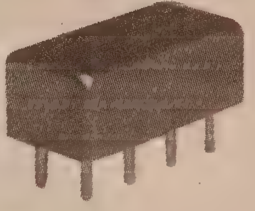
Popular mixers widely used in many amateur radio projects.

SBL-1

- Double balanced mixer
- LO/RF, 1-500 MHz
- IF, DC-500 MHz
- +7dbm LO
- 8 pin package

PIN CONNECTIONS

LO	8
RF	1
IF	3,4
GND	2, 5, 6, 7



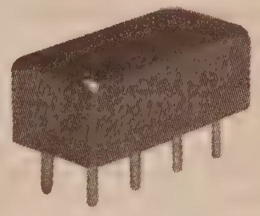
SBL-1 .... $7.95

SBL-1X

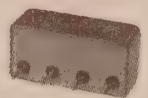
- Double balanced mixer
- LO/RF, 10-1000 MHz
- IF, 5-500 MHz
- +7.5dbm LO
- 8 pin package

PIN CONNECTIONS

LO	8
RF	3, 4
IF	1
GND	2, 5, 6, 7



SBL-1X $9.95



MINI-CIRCUITS "TUF" SERIES FREQUENCY MIXERS

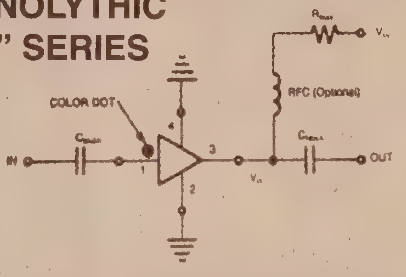
PIN CONNECTIONS

LO	4
RF	1
IF	2
GND	3

PART NO.	FREQUENCY (MHZ) LO/RF	FREQUENCY (MHZ) IF	CONVERSION LOSS db (max)	PRICE
TUF-1	2-600	DC-600	7	8.95
TUF-2	50-1000	DC-1000	7.5	10.25
TUF-3	.15-400	DC-400	7	11.45
TUF-5	20-1500	DC-1000	9	15.95

MINI-CIRCUITS MONOLYTHIC AMPLIFIERS "MAR" SERIES

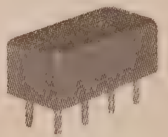
- Broadbanded
- Minimum External Parts Count
- DC to 2 GHz
- 50 Ohm Input/Output Impedance
- Small Package Size



TYPICAL BIASING CONFIGURATION

PART NO.	COLOR DOT	FREQ fL fU	GAIN, dB typical (at MHz) 100	500	1000	2000	MIN	PRICE
MAR-1	Brown	DC-1000	18.5	17.5	15.5	—	13.0	3.95
MAR-2	Red	DC-2000	13	12.8	12.5	11	8.5	4.35
MAR-3	Orange	DC-2000	13	12.8	12.5	10.5	8.0	4.45
MAR-4	Yellow	DC-1000	8.2	8.2	8.0	—	7.0	4.55
MAR-6	White	DC-2000	20	19	16	11	9	4.30
MAR-7	Violet	DC-2000	13.5	13.1	12.5	10.5	8.5	4.75
MAR-8	Blue	DC-1000	33	28	23	—	19	4.75

MINI-CIRCUITS "MAT" SERIES FIXED ATTENUATORS



DEFINITION: A device used to reduce power levels of a signal by a fixed amount with little or no reflections. The output signal is attenuated relative to the input signal while the input and output impedance is maintained close to 50 ohms (or 75 ohms) over the specified bandwidth. Hence, this device is often used to improve interstage matching in a circuit.

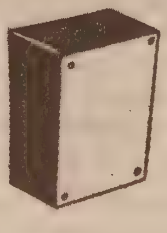
SPECIFICATIONS: • Frequency Range (mhz) DC-1500 • Power (w) .5

PART NUMBER	ATTENUATION (db)	PRICE
MAT-3	3	SPECIAL ORDER - CALL
MAT-6	6	SPECIAL ORDER - CALL

DETAIL SPECIFICATIONS AND APPLICATION NOTES CAN BE DOWNLOADED FROM: Mini-Circuits: www.minicircuits.com

ENCLOSURES

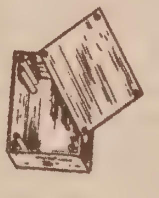
HANDY BOXES WITH ALUMINUM PANEL



Made of sturdy plastic. Removable aluminum cover. Perfect for housing test equipment, experimental projects. Ideal for hobbyists, etc.

PART NO.	SIZE (INCHES) W	L	H	PRICE
EN-784	3 1/4	2 1/8	2 1/8	3.55
EN-785	4	2 1/8	1 5/8	3.90
EN-786	6 1/4	3 3/4	2 1/8	7.15

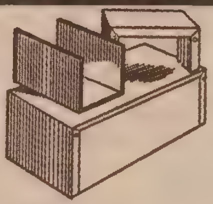
PLASTIC UTILITY BOX WITH PLASTIC COVER



Made of sturdy plastic, removable plastic cover. Perfect for housing test equipment, experimental products. Ideal for hobbyists, etc. Gray color.

PART NO.	SIZE (INCHES) W	L	H	PRICE
90-880	2 1/8	4 1/8	1 3/4	3.00
90-881	2 1/2	5 1/8	1 3/4	3.80
90-882	3 1/2	5 7/8	2 1/2	5.70
90-883	4 1/2	7 3/8	2 9/16	7.20

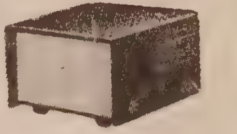
HAMMOND ECONOMY PROJECT CASES



Economical two-piece construction permits installation of more componets than possible in more conventional designs. Cases are made of .040" unpainted aluminum. These are ideal project inclosures for most projects. Wide assortment of sizes. Drills easily. Screws Incl.

PART NO.	SIZE, INCHES A(L)	B(W)	C(H)	PRICE
1411BU	2.7	2.2	1.6	3.20
1411CU	3.2	2.2	1.1	3.40
1411DU	3.2	2.2	1.6	3.70
1411FU	4.0	2.2	2.7	4.15
1411GU	4.0	2.2	1.6	3.95
1411HU	4.0	2.2	2.2	4.30
1411KU	5.0	2.2	2.2	5.30
1411LU	5.0	4.0	3.0	6.60
1411MU	6.0	3.0	3.0	7.45
1411NU	5.0	3.0	2.1	5.25
1411PU	6.0	5.0	4.0	9.50
1411QU	7.0	5.0	3.0	6.30
1411RU	8.0	6.0	3.5	13.40
1411SU	8.0	4.0	3.0	11.95
1411TU	10.0	2.2	1.6	13.40
1411UU	10.0	6.0	3.5	16.80
1411WU	12.0	3.0	2.2	16.40
1411XU	12.0	7.0	4.0	21.25
1411ZU	17.0	5.0	4.0	23.90

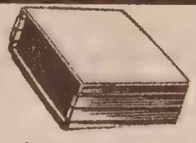
STEEL BOXES WITH ALUMINUM CHASSIS



Attractive design, black wrinkle finish housing with gray aluminum base. Cover has vented sides.

PART NO.	SIZE (INCHES) W	L	H	PRICE
16-020	4	3 1/4	2 3/16	10.50
16-022	5 7/8	4	2 3/8	10.80

TEST EQUIPMENT AND INSTRUMENT CASE

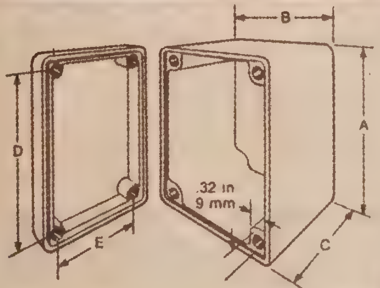


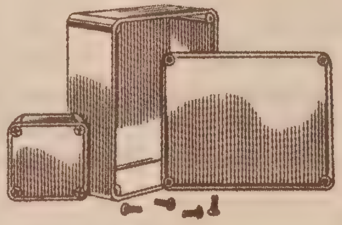
These deluxe instrument cases feature separate front and back panels, internal slots to hold p.c. boards in place and internal mounting posts for securing p.c. boards. The case assembles together with 2 screws. Case has metal studs for non stripping of screws holding case together. Front and back panels are plastic and are easily machined and drilled. Case top and bottom are grey, front and back panel are black.

PART NO.	SIZE (INCHES) L	W	H	PRICE
PB200	8"	6-1/4"	2-1/2"	$11.95
PB250	10-1/8"	7-3/8"	3-3/8"	$12.95

DIE CAST, ABS & STYRENE ENCLOSURES

HAMMOND DIECAST BOXES



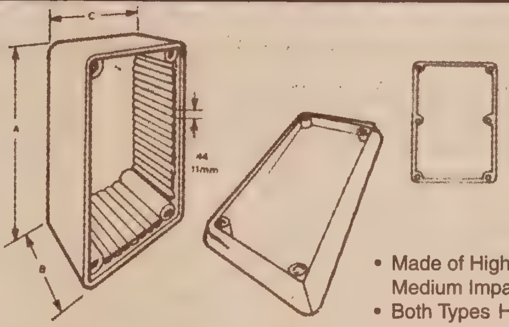


- Drilled and Tapped with Countersunk Lid and Four 6-32 x 1/2 Phillips Screws
- Interlocking Flange on Lid

Diecast aluminum alloy boxes with tumbled surface come drilled and tapped with countersunk lid and four 6-32 x 1/2 Phillips screws. Smaller sizes make excellent boxes for RF connectors because of their RF shielding capabilities. All models have center posts on dimensions A & B; except types with suffix D & E have center posts only on dimensions A.

PART NO.	DIMENSIONS (INCH) A	B	C	D	E	PRICE EACH
1590A	3.62	1.50	1.07	3.24	1.12	6.95
1590B	4.37	2.47	1.07	3.99	1.99	7.95
1590BB	4.68	3.69	1.18	4.31	3.31	10.30
1590C	4.68	3.69	2.06	4.31	3.31	11.60
1590D	7.39	4.70	2.06	7.0	4.31	19.10
1590E	7.39	4.70	3.06	7.0	4.31	20.25
1590F	7.39	7.37	2.50	7.0	7.0	27.50
1590LB	1.98	1.98	1.07	1.6	1.6	7.20
1590S	4.33	3.23	1.58	3.96	2.85	10.50
1590T	4.72	3.15	2.17	4.35	2.78	10.80
1590U	4.72	4.72	2.17	4.35	4.35	15.95
1590V	4.72	4.72	3.54	4.35	4.35	21.90

HAMMOND ABS AND STYRENE BOXES



- Made of High Impact Styrene or Medium Impact ABS
- Both Types Have Interlocking Lid

The styrene cases are small and molded in high impact Styrene Plastic. ABS cases are molded in an improved medium impact ABS thermoplastic with flame retardant properties and carry a flammability rating of UL 94V-0 at 1.47mm thickness and a continuous use temperature rating of 70°C. Both have integral card guides that accept 0.062" PC cards. The styrene boxes are available in black only while the ABS cases come in blue or black. Come with four self-tapping screw countersuck into the lid, and drilled and tapped integral brass bushings. Type 1591E has removable center brace and 6 lid mounting holes.

BLACK STYRENE PART NO.	PRICE EACH	BLACK ABS PLASTIC PART NO.	PRICE EACH	DIMENSIONS (INCH) A	B	C
1591LSBK	3.26	1591LBK	5.25	3.34	1.38	2.20
1591ASBK	3.00	1591ABK	4.90	3.93	.82	1.97
1591BSBK	3.05	1591BBK	5.30	4.41	1.06	2.44
1591CSBK	3.40	1591CBK	5.60	4.72	1.41	2.55
1591DSBK	5.09	1591DBK	8.25	5.90	1.80	3.14
1591ESBK	6.10	1591EBK	10.00	7.74	2.24	4.33
1591GSBK	4.20	1591GBK	6.70	4.75	1.18	3.69
1591HSBK	4.10	1591HBK	6.60	6.52	.98	2.78
1591SSBK	4.40	1591SBK	7.15	4.33	1.58	3.23
1591TSBK	4.93	1591TBK	7.90	4.72	2.17	3.15
1591USBK	5.30	1591UBK	8.50	4.72	2.17	4.72
1591VSBK	6.30	1591VBK	10.10	4.72	3.54	4.72

FET'S, RF, POWER TRANSISTORS, SCR'S & HEX FET'S

PART NO.	DESCRIPTION	CASE STYLE	PRICE EACH
2N3054	NPN 55V, 4A SW/LINEAR AMP	TO-66	CALL
2N3055	NPN 60V, 15A SW/AMP	TO-3	1.10
MJE3055T	NPN 60V, 15A SW/AMP	TO-220	.60
2N3442	NPN 140V, 10A HI PWR LINEAR AMP	TO-3	2.45
2N3584	NPN 250V, 2A AF PWR AMP	TO-66	3.50
2N3713	NPN AUDIO PWR AMP/SW	TO-3	2.95
2N3771	NPN 40V, 30A SWITCH/AMP	TO-3	1.95
2N3772	NPN 60V, 20A AF PWR AMP	TO-3	2.10
2N3773	NPN 140V, 16A AF PWR AMP	TO-3	2.49
2N3789	PNP 70V,15A GP AMP/SW	TO-3	3.29
2N3792	PNP 180V, 16A AUDIO AMP	TO-3	CALL
2N5038	NPN 150V, 25A POWER SWITCH	TO-3	4.26
2N5039	NPN 75V,20A POWER AMP/SW	TO-3	CALL
2N5293	NPN 70V,4A AF POWER OUTPUT	TO-220	2.70
2N5301	NPN 100V,30A HIGH POWER AMP	TO-3	4.53
2N5629	NPN 100V,30A AUDIO AMP	TO-3	3.17
2N5634	NPN 140V,10A HI SPEED SWITCH	TO-3	C ALL
2N5878	NPN 180V,16A AUDIO AMP	TO-3	2.43
2N5881	NPN, 100V,30A POWER SWITCH	TO-3	2.96
2N6029	PNP 140V,20A HIGH PWR AMP	TO-3	4.98
2N6055	NPN 60V, 8A DARLINGTON AMP	TO-3	CALL
2N6101	NPN 70V, 10A AF PWR/REG/SW	TO-220	4.29
2N6102	NPN 40V, 10A AF PWR/REG/SW	TO-220	CALL
2N6125	PNP 60V, 4A PWR DR/PO/SW	TO-220	1.19
2N6246	PNP 60V,15A AF OUTPUT/SW	TO-3	CALL
2N6385	NPN 80V,10A DARLINGTON PWR SW	TO-3	5.79
2N6469	PNP 40V, 15A AF OUTPUT/SW	TO-3	CALL
2N6488	NPN, 100V,15A AF/PO/REG/SW	TO-220	2.79
2N6547	NPN 400V. 15A HIGH VOLT SW	TO-3	6.55
2N6556	PNP 75V, 5A AF OUTPUT SW	TO-3	CALL
MJE344	NPN 300V, 7A AUDIO PWR AMP	TO-126	CALL

Items marked call have been discontinued by the manufacturer, however at the time of this printing we still had limited stock on hand.

TIP POWER TRANSISTORS

PART NO.	DESCRIPTION	CASE STYLE	PRICE EACH
TIP29	NPN 40V, 5A PWR AMP/SW	T0-220	.80
TIP29A	NPN 60V, 5A PWR AMP/SW	T0-220	.80
TIP29B	NPN 80V, 5A PWR AMP/SW	T0-220	.84
TIP29C	NPN 100V, 5A PWR AMP/SW	T0-220	.84
TIP30	PNP 40V, 5A PWR AMP/SW	T0-220	.80
TIP30A	PNP 60V, 5A PWR AMP/SW	T0-220	.80
TIP30B	PNP 80V, 5A PWR AMP/SW	T0-220	.84
TIP30C	PNP 100V, 5A PWR AMP/SW	T0-220	.90
TIP31	NPN 40V, 5A PWR AMP/SW	T0-220	.90
TIP31A	NPN 60V, 5A PWR AMP/SW	T0-220	.90
TIP31B	NPN 80V, 5A PWR AMP/SW	T0-220	.94
TIP31C	NPN 100V, 5A PWR AMP/SW	T0-220	1.20
TIP32	PNP 40V, 5A PWR AMP/SW	T0-220	.70
TIP32A	PNP 60V, 5A PWR AMP/SW	T0-220	.70
TIP32B	PNP 80V, 5A PWR AMP/SW	T0-220	.74
TIP32C	PNP 100V, 5A PWR AMP/SW	T0-220	.84
TIP41	NPN 40V, 7A PO/REG/SW	T0-220	.95
TIP41A	NPN 60V, 7A PO/REG/SW	T0-220	.95
TIP41B	NPN 80V, 7A P0/REG/SW	T0-220	.95
TIP41C	NPN 100V, 7A PO/REG/SW	T0-220	.95
TIP42	PNP 40V, 7A PO/REG/SW	T0-220	1.00
TIP42A	PNP 60V, 7A PO/REG/SW	T0-220	1.00
TIP42B	PNP 80V, 7A PO/REG/SW	T0-220	1.00
TIP42C	PNP 100V, 7A PO/REG/SW	T0-220	1.10
TIP47	NPN 250V, 7A HV AF AMP/SW	T0-220	.84
TIP48	NPN 300V, 1A HV AF AMP/SW	T0-220	.84
TIP49	NPN 350V, 1A HV AF AMP/SW	T0-220	.84
TIP50	NPN 400V, 1A HV AF AMP/SW	T0-220	.95
TIP110	NPN 60V, 2A POWER DARLINGTON	T0-220	1.15
TIP111	NPN 80V, 2A POWER DARLINGTON	T0-220	1.15
TIP112	NPN 100V, 2A POWER DARLINGTON	T0-220	1.15
TIP115	PN P60V, 2A POWER DARLINGTON	T0-220	.85
TIP116	PNP 80V, 2A POWER DARLINGTON	T0-220	.85
TIP117	PNP 100V, 2A POWER DARLINGTON	T0-220	.85
TIP120	NPN 60V, 5A POWER DARLINGTON	T0-220	1.00
TIP121	NPN 80V, 5A POWER DARLINGTON	T0-220	1.15
TIP122	NPN 100V, 5A POWER DARLINGTON	T0-220	1.10
TIP125	PN P60V, 5A POWER DARLINGTON	T0-220	1.10
TIP126	PNP 80V, 5A POWER DARLINGTON	T0-220	.85
TIP127	PNP 100V, 5A POWER DARLINGTON	T0-220	.85

RF POWER TRANSISTORS

PART NO.	POWER WATTS	CASE TYPE	PRICE EACH
2N3553	4	T0-39	3.75
2N3866	1	T0-39	2.40
2N6082	25	145A-09	46.25
2N6083	30	145A-09	28.60
2SC799	3	T0-39	6.95
2SC1957	5	T0-126	4.95
2SC2020	8	T0-220	8.95
2SC2092	5	T0-220	7.95
MRF207	1	T0-39	12.65
MRF237	4	T0-39CE	11.95
MRF454A	80	145A-10	35.85
MRF455	60	211-11	25.30
MRF472	5	T0-126	6.95
MRF475	12	T0-220	10.40
MRF476	3	T0-220	6.30
MRF485	15	T0-220	10.40

Motorola has discontinued most of the RF Power Transistors shown. If Motorola part is unavailable we will substitute with the NTE direct equal. We have been supplying the NTE substitute for many years with out any problems. The NTE devices are manufactured to the same strict specifications or even better.

MICROWAVE TRANSISTORS

MRF571 NPN, 10V, 70mA, Ft 8.0GHz, H_{FE} 50-300 .... 5.95
MRF901 NPN, 15V, 70mA, Ft 4.5GHz, H_{FE} 30 min., 80 .... 3.95

FIELD EFFECT TRANSISTORS (FET'S)

PART NO.	DESCRIPTION	CASE STYLE	PRICE EACH
2N3819	NCH JFET VHF AMP/MIX	T0-92	.75
2N3823	NCH JFET VHF/UHF AMP	T0-72	1.60
2N4393	NCH JFET	T0-18	1.75
2N4416	NCH JFET VHF AMP/MIX	T0-72	1.80
2N5485	NCH JFET UHF/VHF AMP	T0-92	.95
3N204	NCH DUAL GATE VHF AMP/MIX (NTE222)	T0-72	10.95
40673	NCH DUAL GATE VHF AMP/MIX (NTE222)	TO-72	10.95
BS170	POWER MOS TRANSISTOR .5A 60V	T0-92	.90
MPF102	NCH JFET VHF/UHF AMP	T0-92	.49

HEX FET'S & MOSFET'S

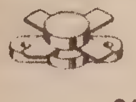
PART NO.	CASE STYLE	TYPE	AMPS/VDS	PRICE
IRF510	T0-220	N-CHNL	4.0A, 100V	1.40
IRF511	T0-220	N-CHNL	4.0A, 60V	1.80
IRF520	T0-220	N-CHNL	10A, 100V	1.20
IRF530	T0-220	N-CH	16A, 100V	1.60
IRF540	T0-220	N-CHNL	27A, 100V	1.95
IRF630	T0-220	N-CHNL	9.0A, 200V	1.60
IRF640	T0-220	N-CHNL	18A, 200V	1.90
IRF730	T0-220	N-CHNL	4.5A, 400V	1.75
IRF740	T0-220	N-CHNL	10A, 400V	2.05

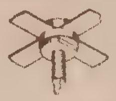
SILICON CONTROLLED RECTIFIER

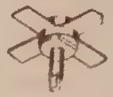
PART NO.	CASE STYLE	DESCRIPTION	PRICE
2N5060	T0-92	.8A 30V	.75
2N5061	TO-92	.8A 60V	.75
2N5062	T0-92	.8A 100V	.75
2N5064	T0-92	.8A 200V	.75
C106B1	T0-202	3.6A 200V	1.85
C122B	T0-220	8A 200V	2.60
C122M	T0-220	8A 600V	4.45

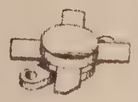
TRANSISTORS

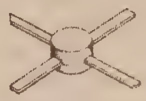
CASE STYLES FOR MOST TRANSISTOR TYPES

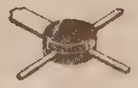

211-07
211-09
(.380" FLANGE)

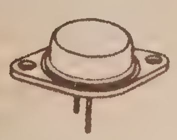

145A-09
(.80" STUD)

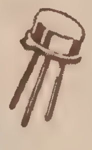

145A-10
(.55" STUD)

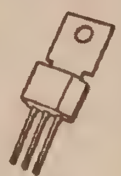

211-11
(.500" FLANGE)

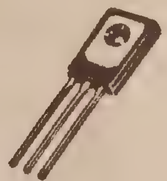

244-04
(.280" STUD)

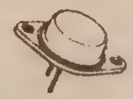

317D-01

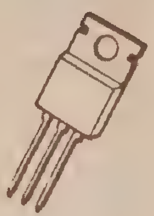

T0-3

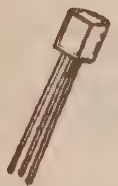

T0-39

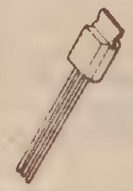

T0-202

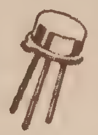

T0-126

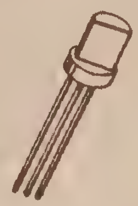

T0-66

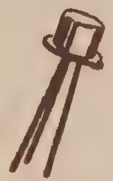

T0-220

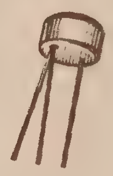

T0-92

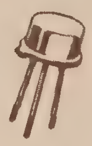

T0-237

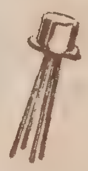

T0-39


T0-98


T0-18

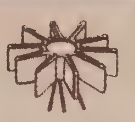

T0-106

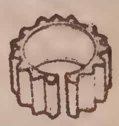

T0-5

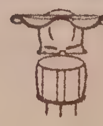

T0-72

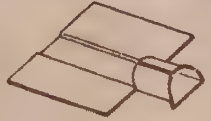
PART NO.	DESCRIPTION	CASE STYLE	ECG/NTE EQUIV.	PRICE EACH
MPSA05	NPN GP AMP/SW	T0-92	123A	.25
MPSA06	NPN MED PWR AMP/SW	T0-92	128	.35
MPSA13	NPN, DARLINGTON, GP AMP	T0-92	46	.40
MPSA42	NPN 300V, .5A HI VOLT. SW.	T0-92	287	.40
MPSA55	PNP, GP AMP/SWITCH	T0-92	159	.35
MPSA65	PNP, DARLINGTON AMP	T0-92	232	.45
MPSA93	PNP 200V, .5A HI VOLT. SW.	T0-92	288	.40
MPSD05	NPN GP AMP/SW	T0-92	123AP	.35
2N404	PNP RF/IF AMP, OSC, MIX	T0-5	100	2.75
2N699	NPN SWITCH/AMP. 80V, 1A	T0-39	396	1.95
2N706	NPN SI GP	T0-18	123A	1.55
2N720	NPN SI AUD. OUT/DRIVER	T0-18	128	1.55
2N918	NPN VHF/UHF OSE. MIX	T0-72	161	.95
2N1499A	PNP RF/IF AMP, OSC, MIX.	T0-18	126A	1.75
2N1893	NPN MED. POWER SWITCH	T0-39	154	.65
2N2218	NPN HIGH SPEED SWITCH	T0-39	123	.59
2N2219A	NPN HIGH SPEED SWITCH	T0-39	123	.69
2N2221	NPN HIGH SPEED SWITCH	T0-18	123A	.59
2N2222A	NPN HIGH SPEED SWITCH,GP	T0-18	123A	.35
PN2222A	NPN GP AMP/SW	T0-92	123AP	.10
2N2270	NPN HIGH CURRENT AMP	T0-39	128	.95
2N2369	NPN HIGH SPEED SWITCH	T0-18	123A	.95
2N2405	PWR AMP/SW, PD 10W	T0-39	282	1.75
2N2484	NPN HIGH GAIN AMPLIFIER	T0-18	123A	.52
2N2904	PNP GP, HIGH SPEED SWITCH	T0-39	129	.65
2N2905	PNP GP, HIGH SPEED SWITCH	T0-39	129	.65
2N2907	PNP GP, HIGH SPEED SWITCH	T0-18	159	.52
MPS2907	PNP GP, HIGH SPEED SWITCH	T0-92	159	.35
2N3019	NPN HI FREQ. AMP. 80V, 1A	T0-39	396	.70
2N3053A	NPN MED CURRENT AMP.	T0-39	128	1.75
2N3251A	PNP, GP AMP/SWITCH	T0-92	159	.99
2N3415	NPN HIGH SPEED SWITCH,	T0-98	123A	.85
2N3553	NPN, RF PWR DRIVER 4-7W	T0-39	473	3.75
PN3563	NPN SI RF-IF AMP/OSC	T0-92	108	.45
2N3567	NPN SI GP	T0-39	123	.40
MPS3640	PNP SATURATED SWITCH	T0-92	159	.45
2N3644	NPN AF PREAMP, DRIVER,	T0-39	129	.35
2N3702	PNP AF PREAMP, DRIVER	T0-92	159	.35
2N3704	NPN GP, MED PWR AMP	T0-92	85	.35
2N3705	NPN GP AMP/SW TO 500MA	T0-92	123AP	.35
2N3707	NPN LOW NOISE HI GAIN	T0-92	199	.65
2N3866	NPN VHF/UHF OSC, AMP,	T0-39	311	2.40
2N3903	NPN GEN PURPOSE AMP	T0-92	123AP	.22
2N3904	NPN GEN PURPOSE AMP/SW	T0-92	123AP	.10
2N3905	PNP GEN PURPOSE AMP/SW	T0-92	159	.10
2N3906	PNP GEN PURPOSE AMP/SW	T0-92	159	.10
2N4013	NPN HIGH CURRENT SWITCH	TO-18	123A	1.05
2N4033	PNP MED PWR AMP	T0-39	129	.90
2N4123	NPN GEN PURPOSE AMP	T0-92	123AP	.65
2N4124	NPN GEN PURPOSE AMP	T0-92	123AP	.22
2N4126	PNP, GP AMP/SWITCH	T0-92	159	.55
2N4141	NPN HI SPEED SWITCH	T0-18	123A	.25
2N4143	PNP AF PRE-AMP, DRIVER	T0-39	159	.25
2N4400	NPN SWITCH/AMPLIFIER	T0-92	123AP	.15
2N4401	NPN GP SWITCH/AMP	T0-92	123AP	.15
PN4401	NPN GEN. PURPOSE	T0-92	123AP	.10
2N4402	PNP GP AMP/SW TO 500 MA	T0-92	159	.15
2N4403	PNP GP AMP/SW	T0-92	159	.15
2N4409	NPN GEN PURPOSE HV AMP	T0-92	194	.30
2N4427	NPN RF DRIVER, PRE-DR	T0-39	346	3.25
2N5086	PNP GP AMP/SW	T0-92	159	.20
2N5088	NPN GP AMP/SW	T0-92	123AP	.60
2N5089	NPN LOW NOISE GP AMP	T0-92	123AP	.55
2N5109	NPN BROAD BAND RF AMP	T0-39	278	2.28
2N5129	NPN GP AMP/SW TO 100MA	T0-92	128	.40
2N5139	PNP GP AMP/SW TO 100MA	T0-106	193	.25
2N5172	PNP GP AMP/SWITCH	T0-92	289A	.40
2N5179	NPN VHF OSC/MIX/IF AMP	T0-72	316	.95
PN5179	NPN VHF OSC/MXR, IF AMP	T0-92	229	.36
2N5209	NPN AF PRE-AMP, DRIVER,	T0-92	123AP	.40
2N5210	NPN LOW NOISE/LEVEL	T0-92	123AP	.30
2N5769	NPN HIGH SPEED SWITCH	T0-92	123AP	.40
2N5770	NPN, RF/IF AMP OSC	T0-92	108	.30
2N5771	NPN GP HV AMP, HIGH	T0-92	108	.90
2N5772	NPN VHF/UHF OSC, MIX	T0-92	108	.35
2N6515	NPN HV GEN. PURPOSE AMP.	T0-92	287	.42
2N6714	NPN HI SPEED SW./CORE DRV.	T0-237	216	.65

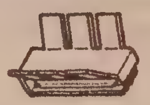
HEAT SINKS AND MOUNTING HARDWARE

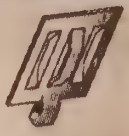

HS-1

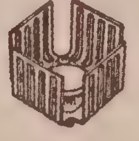

HS-05

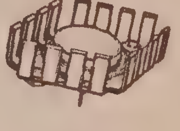

HS-212

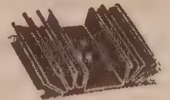

HS-210

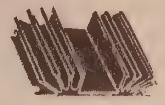

HS-6010

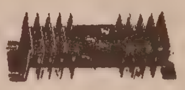

HS-092

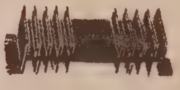

HS-102

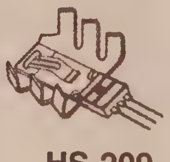

HS-7

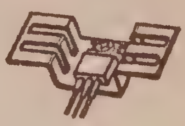

HS-118

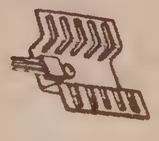

HS-118NH

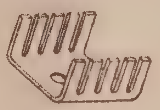

HS-116

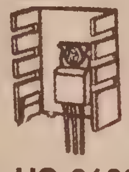

HS-116NH

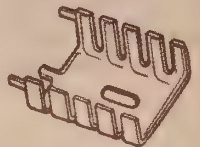

HS-209

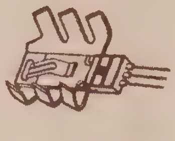

HS-6071

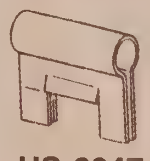

HS-6072

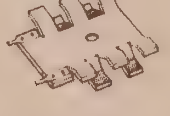

HS-6073

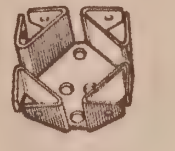

HS-6109

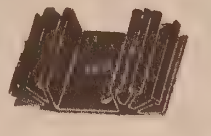

HS-107

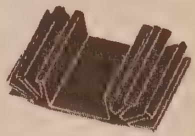

HS-208


HS-6047


HS-6025


HS-203


HS-117


HS-117NH

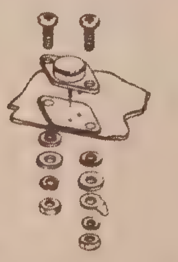
PART NO.	DESCRIPTION	PRICE
HS-1	T0-5, SNAP ON 3/4" DIA X 3/16"H	2.45
HS-05	T0-5, ECONOMY SNAP ON	.85
HS-212	T0-5, SNAP ON WITH SIDE FINS	1.10
HS-210	T0-92, CLIP ON .59" X .59"	1.40
HS-6010	DIP IC, 14-16 PIN CLIP ON	.95
HS-092	T0-92, ECONOMY SLIP ON	.50
HS-102	T0-3, IDEAL FOR TIGHT SPACES	1.25
HS-7	T0-3, 1.88 L X 1.375"W X 1"H	1.25
HS-118	T0-3, HVY. DUTY, RADIAL FIN DESIGN	12.70
HS-118NH	T0-3, SAME AS HS118 BUT NO HOLES	11.95
HS-116	T0-3, MEDIUM POWER LEVELS	11.80
HS-116NH	T0-3, SAME AS HS-116 BUT NO HOLES	9.90

PART NO.	DESCRIPTION	PRICE
HS-209	T0-220, SNAP ON, MOUNT VERT. OR HOR.	.95
HS-6071	T0-220, FINNED COOLER .75"H X 1.75"W	.35
HS-6072	T0-220, ECONOMY COOLER .75"H X .75"W	.35
HS-6073	T0-220, WIDE FINNED 1.75"H X 1.75W"	.35
HS-6109	T0-220, 6/32 MOUNTING SCREW ATTACHED	.40
HS-107	T0-220, WITH MOUNTING TABS	.95
HS-208	T0-220, SNAP ON MT. VERT. OR HORIZ.	.95
HS-6047	T0-202, SNAP ON COOLER	.60
HS-6025	T0-220, 1-7/8"H X 7/8"W	.35
HS-203	T0-66, NATURAL OR FORCED CONVENTION COOLING	3.78
HS-117	T0-66, EFFICIENT RADIAL FIN 2" X 2"	10.90
HS-117NH	T0-66, SAME AS HS-117 BUT NO HOLES	10.60

MOUNTING HARDWARE & TRANSISTOR SOCKETS

T0-3 MOUNTING KIT

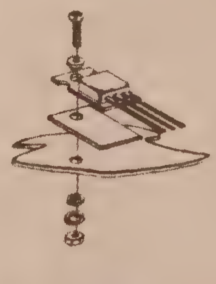
INCLUDES ONE MICA INSULATOR, TWO SHOULDER WASHERS, TWO FLAT WASHERS, TWO HEX NUTS, TWO 6/32 SCREWS, TWO LOCK WASHERS AND ONE SOLDER LUG.



MK-T03 ...... 1.55

T0-220 MOUNTING KIT

INCLUDES ONE MICA INSULATOR, ONE FLAT WASHER, ONE HEX NUT, ONE 4/40 SCREW AND ONE LOCK WASHER.



MK-T0220 .. 1.55

T0-3 MICA INSULATORS

5 PIECES PER PACKAGE

MI-T03 .... .50

T0-220 MICA INSULATORS

5 PIECES PER PACKAGE

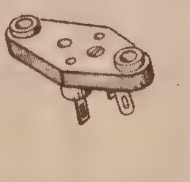
MI-T220 ...... $.40

TRANSISTOR SOCKET

FOR T0-92, T0-5, OR T0-72 DEVICES
PC MOUNTING

T3400 .... $.50

T0-3 TRANSISTOR SOCKET



SK-T03 ... $1.40

HEAT SINK COMPOUND

OUTSTANDING HEAT TRANSFER PROPERTIES. IT DOES NOT SOFTEN UNDER ELEVATED TEMPERATURES AND WILL NOT DRY OUT OR HARDEN. PROVIDES A HEAT SINK WHEN MOUNTING TRANSISTORS TO CHASSIS AND METALLIC HEAT SINKS.

10-8121 21 GRAM TUBE **$2.99**
10-8109 34 GRAM (1 oz.)TUBE **$7.99**

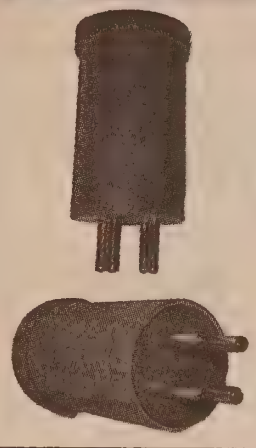
8 PIN LOW PROFILE SOCKET

Fits TO-5 devices
PC mounting
Gold plated contacts
Hard to find item

T805 .... $2.30

ANTIQUE RADIO PARTS — CONSTRUCTION OR REPAIR

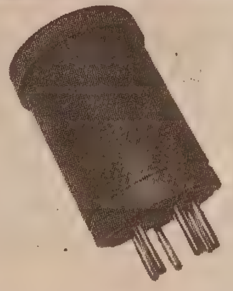
PLUG IN COIL FORMS



Wind your own coils with these plug in coil forms. Made from Grade XX Phenolic. Equipped with rim, making it easy to insert and pull out. Coils measure 1 1/4 Dia. by 2 1/4"H. Exclusive of the pins. These are like coil forms used in all the early receivers and transmitters. Hard to find them. Will mount in a 4, 5 or 6 pin tube socket.

PART NO.	PINS	PRICE
CF-4	4	7.40
CF-5	5	7.40
CF-6	6	7.40

NATIONAL SW-3
REPLACEMENT COIL FORMS



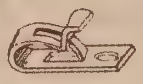
Direct Replacement Form for National SW-3 receiver. Tan phenolic. 6 pins. Measures 1 1/2" Dia. x 2 1/4" Dia.

CF-6SW **$9.40**

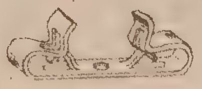
National SW-3 Coil Winding Manual. A 19 page book explaining in detail how to wind coils for the SW-3 using our CF-6SW coil forms. Also included is information on the National SW-3.

SW-3M **$4.00**

FAHNESTOCK CLIPS



SINGLE TYPE
#2090



DOUBLE TYPE
#FC536

One of the oldest and most popular terminals ever made. Ideal for experimental bread-board assemblies where connecitons are to be changed readily. Made of brass with nickel-plated finish. #2090 Sold in packs of 10. FC536 Sold Each.

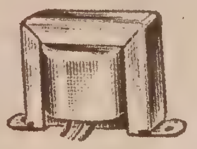
2090 5/16" W x 3/4" L $1.20/10 Pack
FC536 3/8" W x 2 1/8" L $1.50 Each

BLANK COIL STOCK MATERIAL

Low loss grade XX phenolic tubing is ideal for winding your own coils. This is the type of coil form you would use to wind a coil for a crystal radio set. Available in 2 diameters and 3 lengths. Can be cut easily to other lengths with a hacksaw.

PART NO.	O.D.	LENGTH	PRICE
PF13	1 1/2"	3"	1.95
PF16	1 1/2"	6"	4.10
PF12	1 1/2"	12"	8.45
PF23	2"	3"	2.10
PF26	2"	6"	4.54
PF22	2"	12"	9.40

ANTIQUE RADIO POWER TRANSFORMER

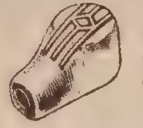


The perfect transformer for tube type radio receivers or transmitters.
Excellent for new construction or replacement. Not surplus, new manufacture. Primary 120VAC, secondary 480VCT at 50MA, 6.3V at 2A
2 3/4"W x 2 1/4"H x 2"D.

Priced affordable enough
to build that old Radio!

TR480 .... **$24.95**

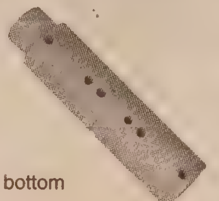
GRID / PLATE CAPS



For new construction or replacement of broken or missing Grid/Plate Caps. Size refers to diameter of Grid/Plate Terminals. Material: Ceramic

PART NO.	DIA.	PRICE
GC14	1/4"	10.00
GC38	3/8"	10.00
GC71	7/16"	10.00
GC91	9/16"	10.00

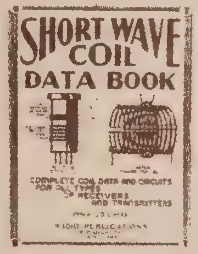
CERAMIC COIL FORM



Ribbed form. 6 holes drilled through to insert wire for winding.Top is tapped 3/48" to mount terminal, etc.
Measures: 1 15/16" L x 1/2" Dia. bottom 3/8" Dia. top.

CF1156 .... **$3.00**

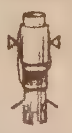
SHORT WAVE COIL DATA BOOK



Quality reprint of the 1937 Gernsback publication includes complete coil data and circuits for all types of receivers and transmitters. Only 16 pages but gives quite a lot of information.

CB830 .... **$3.00**

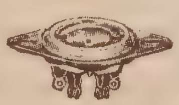
ADJUSTABLE RF CHOKE
J.W. MILLER #4204



Nylon body with iron core tuning slug. Measures 3/8"Dia. x 3/8"Long Inductance 5-12-µH

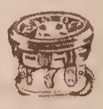
JW4204 .... **$2.95**

FIGURE 1



SADDLE MOUNT

FIGURE 2

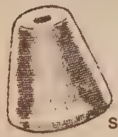


RETAINING RING

Listed below are the tube sockets we stock. Due to availability we may substitute between types unless you specify no substitutions. Sockets are N.O.S. (New Old Stock). Some may be ceramic, bakelite, or plastic. Due to various manufacturers, styles may vary. We will try to accommodate to your preference if you specify.

PART NO.	PINS	FIG.	PRICE	PART NO.	PINS	FIG	PRICE
STM4	4	1	6.50	RTR7M	7 Miniature	2	4.50
RTR4	4	2	6.50	STM8	8 Octal	1	4.50
STM5	5	1	6.50	RTR8	8 Octal	2	4.50
RTR5	5	2	6.50	STM8L	8 Loctal	1	5.50
STM6	6	1	6.50	RTR8L	8 Loctal	2	5.50
RTR6	6	2	6.50	STM9	9	1	4.50
STM7	7	1	4.50	RTR9	9	2	4.50
RTR7	7	2	4.50	STM11	11	1	4.50
STM7M	7 Miniature	1	4.50	RTR11	11	2	4.50

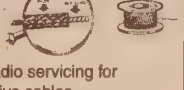
PORCELAIN CONE INSULATOR



8/32" threaded top & bottom 1" long. Top dia. 1/2" Base dia. 1". Can be use as tie point for antenna feed in's or standoff for high voltage application.

PC112 .... **$1.99**

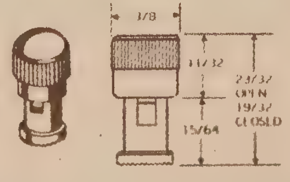
DIAL DRIVE CORD



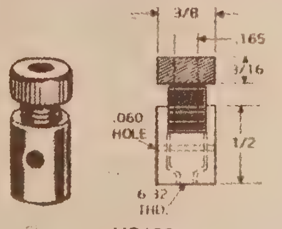
No stretch black cord made of nylon braid over fiberglass core. Standard .028" Dia. size. For general use in radio servicing for replacement of dial and capacitor drive cables. Sold on 25 foot spools.

DC-75 .... **$3.25**

EARLY STYLE KNOB-TYPE BINDING POSTS



HS159



HS136

An exact reproduction of the early style binding posts found on receivers, transmitters, and test equipment.
Precision machined from brass, nickel plated. Use with phone tip or wire to #14AWG. #HS136. Also accepts standard Banana plug. Mounts in #6 (9/64") clearance hole.

HS159 .... **$1.95**
HS136 .... **$1.90**

FERRITE TOROID CORES, RODS, BEADS & BALUNS

Ferrite toroid cores are used for low power tuned circuits and especially for wideband transformers and baluns for transistor coupling and antenna matching. They have high permeability so you get high inductance with few turns. The low frequency cores are used in switched-mode power supplies.

The frequency ranges listed in the table are those recommended for tuned circuits. **For wideband transformers the top frequency is ten times higher.**

To find the turns required for a desired indutance use the formula at the right.

$$\text{TURNS} = 1000\sqrt{\frac{\text{DESIRED L (mH)}}{\text{mH PER 1000 TURNS (FROM TABLE)}}}$$

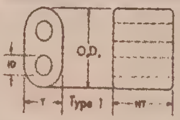
CHART SHOWING mH PER 1000 TURNS

CORE SIZE	MIX 43 µ = 850 .01 - 1 MHz	MIX 61 µ =125 .2 - 10 MHz	MIX 63 µ = 40 15- 25 MHz	MIX 67 µ =40 10 - 80 MHz	MIX 68 µ = 20 80 - 180 MHz	MIX 75 µ =5000 .01 - 1 MHz	MIX 77 µ = 1800 .001 - 2 MHz	SIZE 0D (in)	SIZE ID (in)	SIZE HT (in)	PRICE
FT23	188	25	8	8	4		396	.23	.12	.06	.60
FT37	420	55	18	18	9	2210	884	.37	.19	.12	.70
FT50	523	68	22	22	11	2750	1100	.50	.28	.19	.85
FT82	557	73	22	22	12	3000	1170	.82	.52	.25	1.30
FT114	603	79	22	22			1270	1.14	.75	.30	2.30
FT140	1060	140					2250	1.40	.90	.50	3.50
FT240	1240	173					2740	2.40	1.40	.50	8.75

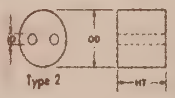
AVAILABLE IN SIZES THAT HAVE mH PER 1000 TURNS SHOWN IN TABLE.

TO ORDER SPECIFY CORE SIZE AND MIX. EXAMPLE: FT50-63

BALUNS and WIDEBAND CORES



The two-hole baluN is commonly used for wideband transformers and impedance matching devices. The primary concern, when designing a wide band transformer, is to extend the band width with a minumum of loss. The limiting factors are inductive reactance and core loss.



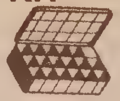
By winding through both holes of the binocular type two-hole baluN, a higher inductance per turn can be obtained than would otherwise be possible with a single hole core.

Dimensions in inches; AL value in mh/1000 turns based on hole to hole winding.

PART NO.	OD	ID	HGT	TH	TYPE	AL	PRICE
BN-43-202	.525	.150	.550	.295	ONE	2890	.65
BN-43-2302	.136	.035	.093	.080	ONE	680	.55
BN-43-2402	.280	.070	.240	.160	ONE	1277	.55
BN-61-202	.525	.150	.550	.295	ONE	425	.65
BN-61-2302	.136	.035	.093	.080	ONE	100	.55
BN-61-2402	.280	.070	.240	.160	ONE	280	.55
BN-61-1802	.250	.050	.240	---	TWO	310	.55
BN-73-202	.525	.150	.550	.295	ONE	8500	.75
BN-73-2402	.275	.070	.240	.160	ONE	3750	.55

POPULAR FERRITE TOROID ASSORTMENT KIT

MULTICOMPARTMENT PLASTIC STORAGE BOX INCLUDED.



INCLUDES 2 EACH — FT23-61 FT23-63
FT37-61 FT37-63 FT37-77

3 EACH — FT23-43 FT23-77 FT37-43
FT50-43 FT50-63 FT50-77
FT82-43 FT82-63

FTA-2 34 PIECES TOTAL $25.95

FERRITE RODS

FERRITE RODS ARE AVAILABLE IN 61 MATERIAL (PERMEABILITY 125, USE FROM .2-10 MHz) AND 33 MATERIAL (PERMEABILITY 800, USE FROM .01-1 MHz).

PART NO.	DESCRIPTION	PRICE
FR-4-33	1/2"DIA, 4"LONG, 33 MATERIAL	9.90
FR-4-61	1/2"DIA, 4"LONG, 61 MATERIAL	9.90
FR-7 1/2-33	1/2"DIA, 7 1/2"LONG, 33 MATERIAL	20.95
FR-7 1/2-61	1/2"DIA, 7 1/2"LONG, 61 MATERIAL	20.95

FERRITE BEADS

PART NUMBER	PRICE (EACH)	PART NUMBER	PRICE (EACH)
FB43-101	.32	FB64-901	.46
FB43-801	.44	FB64-2401	.50
FB43-2401	.50	FB73-101	.32
FB43-5111	.50	FB73-801	.44
FB64-101	.32	FB73-2401	.50
FB64-801	.44	FB75-101	.34

PRICES SUBJECT TO CHANGE.

SCOTCH 27 GLASS CLOTH TAPE

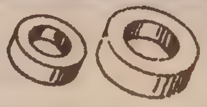
HIGH TEMPERATURE TAPE WITH THERMOSETTING PRESSURE-SENSITIVE ADHESIVE. IT IS RECOMMENDED FOR THE WRAPPING OF LARGER TOROID CORES BECAUSE OF ITS EXCELLENT INSULATING PROPERTIES.

1/2" x 66 FT.

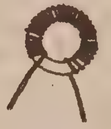
MM27 .... $8.75 EACH

TOROIDS AND MAGNET WIRE

IRON POWDER TOROID CORES



Iron powder toroids are suitable for tuned tank circuits, filters, Pi network inductors, etc. They are more stable than ferrites and do not saturate as easily. They are available in a number of different mixes. For best "Q" use the mix specified for your frequency. The cores are color coded to show the mix. See table below. To find the correct number of turns for your coil use the formula at right.



$$\text{TURNS} = 100\sqrt{\frac{\text{DESIRED L } (\mu\text{H})}{\mu\text{H PER 100 TURNS (FROM TABLE)}}}$$

CHART SHOWING µH PER 100 TURNS

AVAILABLE IN SIZES THAT HAVE µH PER 100 TURNS SHOWN IN TABLE.

CORE SIZE	MIX 0 100-300 MHz TAN	MIX 1 .5-5 MHz BLUE	MIX 2 2-30 MHz RED	MIX 3 .05-.5 MHz GREY	MIX 6 10-50 MHz YELLOW	MIX 10 30-100 MHz BLACK	MIX 12 50-200 MHz GRN/WHT	MIX 15 .1-2 MHz RED/WHT	MIX 26 0-1 MHz YEL/WHT	SIZE 0D (in)	SIZE ID (in)	SIZE HT (in)	PRICE
T12	3.0	48	20	60	17	12	7	50		.12	.06	.05	.40
T16	3.0	44	22	61	19	13	8	55		.16	.08	.06	.40
T20	3.5	52	27	90	22	16	10	65		.20	.09	.07	.40
T25	4.5	70	34	100	27	19	12	85		.25	.12	.10	.40
T30	6.0	85	43	140	36	25	16	93	325	.30	.15	.13	.50
T37	4.9	80	40	120	30	25	15	90	275	.37	.20	.13	.55
T44	6.5	105	52	180	42	33	19	160	360	.44	.23	.16	.60
T50	6.4	100	49	175	40	31	18	135	320	.50	.30	.19	.65
T68	7.5	115	57	195	47	32	21	180	420	.68	.37	.19	.90
T80	8.5	115	55	180	45	32	22	170	450	.80	.50	.25	1.20
T94	10.6	160	84	248	70	58		200	590	.94	.56	.31	1.50
T106	19.0	325	135	450	116				900	1.06	.57	.44	2.25
T130	15.0	200	110	350	96			250	785	1.30	.78	.44	2.75
T200		250	120	425	100				895	2.00	1.25	.55	6.50
T225			120	425	100				950	2.25	1.40	.55	7.00
T225A			215							2.25	1.40	1.00	8.75
T300			115						825	3.05	1.93	.50	11.75
T400			185						1320	4.00	2.25	.65	12.75
T400A			360						2600	4.00	2.25	1.30	24.00

TO ORDER SPECIFY CORE SIZE AND MIX. EXAMPLE: T50-2

MAGNET WIRE

Enamel coated solid bare copper. For winding coils, transformers and toroids. Prices for 1/4 lb. spools.

PART NO. /SIZE	PRICE (EACH)	PART NO. /SIZE.	PRICE (EACH)
MW14	$4.10	MW28	$5.50
MW16	$4.25	MW30	$5.75
MW18	$4.40	MW32	$6.20
MW20	$4.50	MW34	$6.80
MW22	$4.70	MW36	$7.25
MW24	$4.85	MW38	$7.80
MW26	$4.95	MW40	$9.25

Q-DOPE

Solution of pure polystyrene in slovents. Dries fast and leaves a clear, protective coating on toriods, coils and transformers, with no or minimal effect on inductive values. May also be used as a cement for molded or fabricated items made of polystyrene.

10-3702 .. (Brush 2 fl. oz. 59 ml)....... **$7.95**

A MUST IF YOU WIND YOUR OWN TOROIDS.

POPULAR IRON POWDER TOROID ASSORTMENT KIT

MULTI-COMPARTMENT STORAGE BOX INCLUDED

INCLUDES:

2 EACH — T25-2 T25-6 T37-2 T37-6 T37-12 T44-2 T50-10 T80-2

3 EACH — T50-2 T50-3 T50-6 T68-2 T68-3 T68-6

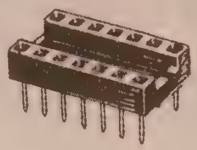
PTA-2 ... 34 PIECES TOTAL $23.95

PRICES SUBJECT TO CHANGE.

IC SOCKETS , RELAYS, & PHOTO CELLS

SOLDERTAIL LOW PROFILE IC SOCKETS

This low profile solder tail dip socket provides high reliability with high performance copper alloy contacts overplated with bright tin. Excellent insertion/extraction forces.

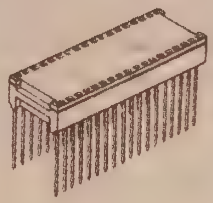


PART NO.	PINS	1-99	100+
LP8	8	.11	.07
LP14	14	.13	.08
LP16	16	.14	.09
LP18	18	.18	.11
LP20	20	.21	.13
LP22	22	.31	.20
LP24	24	.28	.18
LP24W*	24	.30	.25
LP28	28	.31	.19
LP40	40	.44	.28

*WIDE SPACING

WIRE WRAP TIN PLATED

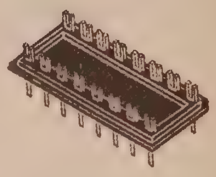
Quality dip (dual in-line package) sockets with tin plated contacts. Available in all popular package sizes — 8 through 40 pins.



PART NO.	PINS	1-99	100+
WW8T	8	.79	.59
WW14T	14	.95	.75
WW16T	16	1.15	.95
WW18T	18	1.20	1.00
WW20T	20	1.25	1.05
WW22T	22	1.45	1.25
WW24T	24	1.50	1.30
WW28T	28	1.55	1.35
WW40T	40	1.85	1.60

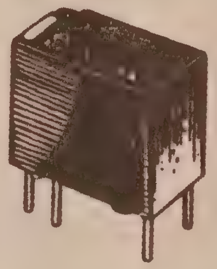
DIP COMPONENT HEADER PLUGS

Dip Component Header Plugs allow for mounting discrete and passive components to be assembled to a standard dip base it can be plugged into a socket or soldered directly to a PC board.



PART NUMBER	PINS	PRICE EACH
DP-14	14 Pin	1.40
DP-16	16 Pin	1.50
DP-24	24 Pin	2.30

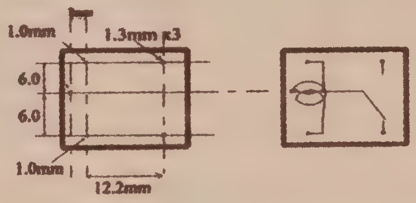
MINIATURE POWER RELAYS
High Capacity (10 Amp)
SPDT Configuration



This series of PC board mounting relays has high contact capacity (10 amps) in a very small Package. They are completely sealed and protected from dust and solder flux. These relays can be used for flow soldered.

Demensions (IN)

3/4W x 9/16H x 5/8D



- **Power Consumption -0.36W**
- **Pull-in Voltage 75% max.**
- **Contact Capacity 10A 24V DC**
- **Resistive Load 10A 120V AC**
- **UL Recognized, CSA Certified**

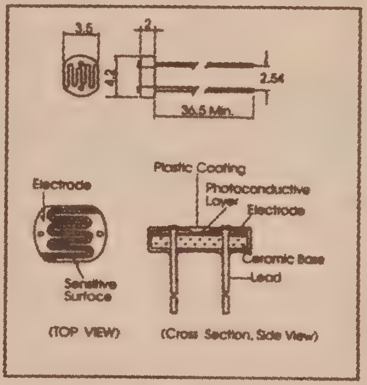
Part No.	Coil Voltage (V DC)	Normal Current (mA)	Coil Resistance (ohm)	Price
RY86-103	3	120	25	3.95
RY86-105	5	73	70	3.95
RY86-106	6	60	100	3.95
RY86-109	9	40	225	3.95
RY86-112	12	30	400	3.95
RY86-118	18	20	900	3.95
RY86-124	24	15	1600	3.95

CADMIUM SULFIDE PHOTO CELLS

The cadmium sulfide photo cell has a high resistance in darkness but resistance is quite low when in light of 100 foot-candles or more. A typical use is for switching on lighting after dark; also used in alarm systems, exposure meters, flame detectors, opto-couplers etc.. All three cells have a dark resistance of 5,000 ohms and 300 ohms in bright light (of 100 cds. or more).

Features:
- Epoxy - Coated Low Profile Cell
- High reliable power dissipation
- Compact dimensions

Applications:
- Auto - Focus Slide Projects
- Exposure Meters
- Contrast Control in TV sets
- Dimmer Switches
- Dimmers for LED and LCD Displays
- Flame Detectors in Oil Burners
- StreetLamp Switching
- Electronic Toys
- OPTO - Couplers
- Electronic Organs



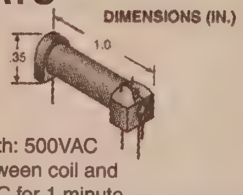
Electrical Characteristics at Ta=25C

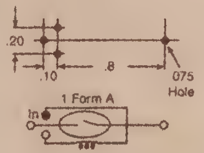
Part No.	O.D.	Max. Power Dissipation	Price
PC10805	5mm	90watts	1.45
PC10807	7mm	150 watts	1.65
PC10810	10 mm	400 watts	2.70

HIGH RELIABILITY REED RELAYS

1 Form A SPST Contacts Normally Open

Specifications:



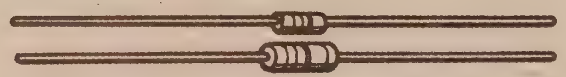


- Contact resistance: 150mΩ (max.)
- Coil temperature rise: 30°C (max.)
- Temperature range: -10°C to +60°C
- Operate time: 1.0mS (max.)
- Release time: 0.5mS (max.)
- Dielectric strength: 500VAC for 1 minute between coil and contacts 200VDC for 1 minute between contacts

Part Number	Coil Volt DC	Coil Res.	Price each
RY5-250	5	250Ω	3.60
RY5-500	5	500Ω	3.60
RY12-105	12	1050Ω	3.60

COILS & CHOKES, & LOOP STIK ANTENNA

CONFORMAL COATED CHOKES



Epoxy conformal coated construction makes these chokes durable and nearly impervious to moisture, etc. Small size, just a little larger than a 1/4 watt resistor. Wide range of values.

- Working voltage 250 VDC maximum
- Core material, Ferrite
- Tolerance +/-5%

PART NUMBER	INDUCTANCE L µH	Q MIN.	TEST FREQ. MHz	FO MIN. MHz	R, dC MAX. OHMS	I, dC MAX. mA
78FR10M	0.10	40	25	400	0.06	500
78FR12M	0.12	40	25	400	0.06	500
78FR15M	0.15	40	25	400	0.07	500
78FR18M	0.18	40	25	400	0.08	450
78FR22K	0.22	40	25	380	0.08	1025
78FR27K	0.27	40	25	360	0.08	950
78FR33K	0.33	40	25	350	0.08	815
78FR39K	0.39	40	25	320	0.09	700
78FR47K	0.47	40	25	300	0.10	650
78FR56K	0.56	40	25	280	0.11	545
78FR68K	0.68	40	25	250	0.12	495
78FR82K	0.82	40	25	200	0.12	415
78F1R0K	1.0	40	25	180	0.15	385
78F1R2K	1.2	40	7.9	165	0.18	590
78F1R5K	1.5	45	7.9	150	0.20	535
78F1R8K	1.8	50	7.9	125	0.25	455
78F2R2K	2.2	50	7.9	110	0.28	395
78F2R7K	2.7	50	7.9	95	0.30	355
78F3R3J	3.3	50	7.9	70	0.34	270
78F3R9J	3.9	45	7.9	65	0.32	250
78F4R7J	4.7	45	7.9	50	0.35	230
78F5R6J	5.6	45	7.9	40	0.40	185
78F6R8J	6.8	40	7.9	30	0.45	175
78F8R2J	8.2	40	7.9	28	0.55	155
78F100J	10	40	2.5	22	0.72	130
78F120J	12	45	2.5	20	0.80	155
78F150J	15	50	2.5	16	0.88	150
78F180J	18	50	2.5	15	1.00	145
78F220J	22	50	2.5	13	1.20	140
78F270J	27	50	2.5	11	1.35	135
78F330J	33	50	2.5	10	1.50	193
78F390J	39	50	2.5	9.5	1.70	185
78F470J	47	60	2.5	8.5	2.30	167
78F560J	56	60	2.5	7.5	2.60	150
78F680J	68	60	2.5	6.5	2.90	137
78F820J	82	60	2.5	6.0	3.20	132
78F101J	100	60	2.5	5.5	3.50	125
78F121J	120	60	0.79	5.4	3.80	100
78F151J	150	60	0.79	4.7	4.40	90
78F181J	180	60	0.79	4.3	5.00	84
78F221J	220	60	0.79	4.0	5.70	76
78F271J	270	60	0.79	3.7	6.50	70
78F331J	330	60	0.79	3.4	9.50	65
78F391J	390	60	0.79	2.8	10.50	60
78F471J	470	60	0.79	2.5	11.60	53
78F561J	560	60	0.79	2.3	13.00	51
78F681J	680	60	0.79	2.0	18.00	45
78F821	820	60	0.79	1.5	23.00	43
78F102J	1000	60	0.79	1.2	26.00	41

PRICE	1-99	100+
	.65	.55

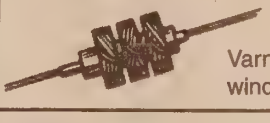
SUB MINIATURE RF CHOKES

Designed to meet the demand for high reliability, ultra-miniature components ideally suited for receivers, transmitters, networks, filters, delay lines and computer applications.

- Tolerance: ±5%
- Small size ranging from .25" to .63"
- Varnish impregnated
- Core material: 1µH to 18MH Iron 25MH to 100MH Ferrite

PART NUMBER	INDUCTANCE L µH	Q MIN.	R, dC MAX OHMS	I, dC MAX mA	PRICE EACH
70F106AI	1	41	.048	2041	2.40
70F126AI	1.2	45	.072	1666	2.40
70F156AI	1.5	42	.096	1443	2.40
70F276AI	2.7	34	.168	1091	2.40
70F336AI	3.3	40	.24	912	2.40
70F396AI	3.9	35	.264	870	2.40
70F476AI	4.7	43	.457	661	2.40
70F566AI	5.6	41	.492	637	2.40
70F686AI	6.8	40	.624	566	2.40
70F105AI	10	36	1.56	277	2.65
70F155AI	15	52	1.92	250	2.65
70F255AI	22	51	2.28	229	2.65
70F335AI	33	50	2.76	208	2.65
70F395AI	39	48	3.36	188	2.65
70F475AI	47	44	3.36	188	2.65
70F565AI	56	45	3.84	176	2.65
70F685AI	68	42	4.2	169	2.65
70F825AI	82	41	4.8	158	2.65
70F104AI	100	25	7.68	139	2.85
70F154AI	150	47	8.16	135	2.85
70F224AI	220	46	11.5	114	2.85
70F334AI	330	41	13.9	103	2.85
70F474AI	470	35	16.3	95	2.85
70F684AI	680	37	19.8	87	2.85
70F824AI	820	33	22.9	80	2.85
70F103AI	1,000	30	24	79	2.95
70F153AI	1,500	40	37.2	63	2.95
70F223AI	2,200	40	45.6	57	2.95
70F253AI	2,500	48	45.6	57	2.95
70F333AI	3,300	52	51.6	53	2.95
70F473AI	4,700	49	64.8	48	2.95
70F563AI	5,600	53	69	46	2.95
70F683AI	6,800	51	78	43	2.95
70F823AI	8,200	48	92.4	40	2.95
70F102AI	10,000	41	101	38	2.95
70F152AI	15,000	50	113	47	3.70
70F182AI	18,000	49	128	44	3.70
70F252AF	25,000	59	115	46	3.70
70F332AF	33,000	61	134	43	3.70
70F101AF	100,000	48	278	29	4.10

NOTE: 1000µH = 1MH; 100,000µH = 100MH

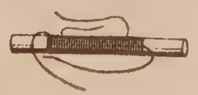


3-Pi CHOKES

Varnish impregnated. Ferrite core. 3-Pi Universal windings. ±10%. (4662 iron core)

PART NUMBER	L MH	Q MIN.	I,dC MAX mA	COIL DIA	PRICE EACH
4662	1	83	160	.47"	4.75
6302	2.5	106	160	.47"	4.75
6304	5	91	160	.53"	4.75
6306	10	108	100	.53"	4.75
6308	25	102	65	.53"	4.75
6310	50	113	65	.53"	4.75

FERRITE "LOOP STIK" ANTENNA

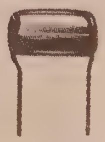


Hard to find loop-stik Antenna. NOW IN STOCK! For radio receivers. Tunes the broadcast band, 540KHz - 1600KHz. Measures 3/8" Dia. x 3 1/2" Long. Includes mounting bracket. Q+25, L=788µH.

LA-540 .... **$2.95**

POLYESTER FILM (MYLAR) CAPACITORS – RADIAL LEAD

We offer these capacitors in a wide range of voltages and capacitance they are radial lead polyester film dipped in a hard epoxy coating to provide excellent protection against moisture. They are very similar to Sprague Orange Drops™



APPLICATIONS
- Blocking, by-pass and coupling of D.C. and signals to VHf range
- Pulse, logic and timing circuits
- General purpose DC applications
- Widely used as replacements in antique radios

100 VOLTS +/– 10%

PART NO.	CAP. µF	1-99	100+
CMY001-1	.001	.17	.14
CMY0012-1	.0012	.17	.14
CMY0015-1	.0015	.17	.14
CMY0018-1	.0018	.17	.14
CMY0022-1	.0022	.17	.14
CMY0027-1	.0027	.17	.14
CMY0033-1	.0033	.17	.14
CMY0039-1	.0039	.17	.14
CMY0047-1	.0047	.17	.14
CMY0056-1	.0056	.17	.14
CMY0068-1	.0068	.17	.14
CMY0082-1	.0082	.17	.14
CMY010-1	.01	.20	.17
CMY012-1	.012	.20	.17
CMY015-1	.015	.20	.17
CMY018-1	.018	.20	.17
CMY022-1	.022	.20	.17
CMY027-1	.027	.20	.17
CMY033-1	.033	.20	.17
CMY039-1	.039	.20	.17
CMY047-1	.047	.20	.17
CMY056-1	.056	.20	.17
CMY068-1	.068	.20	.17
CMY082-1	.082	.20	.17
CMY104-1	.1	.22	.19
CMY124-1	.12	.32	.29
CMY154-1	.15	.32	.29
CMY184-1	.18	.40	.37
CMY224-1	.22	.50	.47
CMY274-1	.27	.50	.47
CMY334-1	.33	.56	.53
CMY394-1	.39	.64	.61
CMY474-1	.47	.84	.81
CMY564-1	.56	.95	.91
CMY684-1	.68	.95	.91
CMY824-1	.82	.95	.91
CMY1.0-1	1.0	1.20	1.15
CMY2.2-1	2.2	1.75	1.65

250 VOLTS +/– 10%

PART NO.	CAP. µF	1-99	100+
CMY010-2	.01	.45	.35
CMY015-2	.015	.45	.35
CMY022-2	.022	.45	.35
CMY027-2	.027	.45	.35
CMY033-2	.033	.45	.35
CMY039-2	.039	.45	.35
CMY047-2	.047	.45	.35
CMY068-2	.068	.50	.40
CMY082-2	.082	.50	.40
CMY104-2	.1	.50	.40
CMY124-2	.12	.50	.40
CMY154-2	.15	.50	.40

250 VOLTS +/– 10%

PART NO.	CAP. µF	1-99	100+
CMY184-2	.18	.60	.55
CMY224-2	.22	.60	.55
CMY274-2	.27	.75	.70
CMY334-2	.33	1.00	.95
CMY394-2	.39	1.00	.95
CMY474-2	.47	1.00	.95
CMY564-2	.56	1.00	.95
CMY684-2	.68	1.00	.95
CMY824-2	.82	1.00	.95
CMY1.0-2	1.0	1.00	.95
CMY1.2-2	1.2	1.00	.95
CMY1.5-2	1.5	1.00	.95
CMY1.8-2	1.8	1.70	1.60
CMY2.2-2	2.2	2.10	1.95
CMY3.3-2	3.3	2.10	1.95
CMY4.7-2	4.7	2.95	2.75
CMY5.6-2	5.6	4.90	4.50

400 VOLTS +/– 10%

PART NO.	CAP. µF	1-99	100+
CMY010-4	.01	.50	.45
CMY015-4	.015	.50	.45
CMY022-4	.022	.50	.45
CMY033-4	.033	.50	.45
CMY047-4	.047	.50	.45
CMY056-4	.056	.50	.45
CMY068-4	.068	.50	.45
CMY082-4	.082	.60	.65
CMY104-4	.1	.65	.65
CMY124-4	.12	.65	.65
CMY154-4	.15	.65	.65
CMY184-4	.18	.65	.65
CMY224-4	.22	.95	.95
CMY274-4	.27	.95	.95
CMY334-4	.33	1.30	1.30
CMY394-4	.39	1.50	1.50
CMY474-4	.47	1.70	1.70
CMY564-4	.56	1.70	1.70
CMY684-4	.68	1.80	1.80
CMY824-4	.82	2.20	2.20
CMY1.0-4	1.0	2.50	2.50

630 VOLTS +/– 10%

PART NO.	CAP. µF	1-99	100+
CMY001-6	.001	.65	.50
CMY0012-6	.0012	.65	.50
CMY0015-6	.0015	.65	.50
CMY0018-6	.0018	.65	.50
CMY0022-6	.0022	.65	.50
CMY0027-6	.0027	.65	.50
CMY0033-6	.0033	.65	.50

630 VOLTS +/– 10%

PART NO.	CAP. µF	1-9	10+
CMY0039-6	.0039	.65	.50
CMY0047-6	.0047	.65	.50
CMY0056-6	.0056	.65	.50
CMY0068-6	.0068	.65	.50
CMY0082-6	.0082	.65	.50
CMY010-6	.01	.65	.50
CMY012-6	.012	.65	.50
CMY015-6	.015	.65	.50
CMY018-6	.018	.65	.50
CMY022-6	.022	.65	.50
CMY027-6	.027	.65	.50
CMY033-6	.033	.65	.50
CMY039-6	.039	.65	.50
CMY047-6	.047	.65	.50
CMY056-6	.056	.75	.65
CMY068-6	.068	.75	.65
CMY082-6	.082	.75	.65
CMY104-6	.1	.75	.65
CMY124-6	.12	.95	.65
CMY154-6	.15	.95	.65
CMY184-6	.18	.95	.65
CMY224-6	.22	1.15	.80
CMY274-6	.27	1.60	1.25
CMY334-6	.33	1.60	1.25
CMY394-6	.39	1.60	1.25
CMY474-6	.47	1.95	1.75
CMY564-6	.56	2.90	2.35
CMY684-6	.68	3.70	3.10
CMY1.0-6	1.0	6.10	5.20
CMY1.5-6	1.5	7.20	6.90
CMY2.0-6	2.0	7.20	6.90
CMY3.0-6	3.0	7.40	7.10

1000 VOLTS +/– 10%
METALLIZED POLYPROPYLENE

PART NO.	CAP. µF	PRICE EACH
CMP001-1K	.001	1.40
CMP0022-1K	.0022	1.45
CMP0047-1K	.0047	1.50
CMP01-1K	.01	1.60
CMP015-1K	.015	1.65
CMP022-1K	.022	2.40
CMP033-1K	.033	2.90

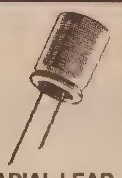
2000 VOLTS +/– 10%
METALLIZED POLYPROPYLENE

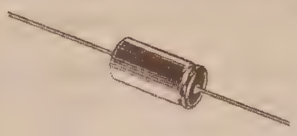
PART NO.	CAP. µF	PRICE EACH
CMP001-2K	.001	1.70
CMP0015-2K	.0015	1.70
CMP0022-2K	.0022	1.70
CMP0033-2K	.0033	1.90
CMP0047-2K	.0047	2.00
CMP01-2K	.01	2.80
CMP015-2K	.015	3.40

ELECTROLYTIC CAPACITORS

GENERAL PURPOSE ALUMINUM ELECTROLYTIC CAPACITORS.

We offer these capacitors in a wide range of voltages and capacitance. Operating temperature range -40°C to +85°C. Capacitance tolerance +/- 20%. NOTE: A higher voltage capacitor may be used in a lower voltage application.


RADIAL LEAD


AXIAL LEAD

25 VOLT RADIAL LEAD

PART NO.	CAP. µF	PRICE EACH
CER3.3-25	3.3	.17
CER4.7-25	4.7	.17
CER10-25	10	.17
CER22-25	22	.17
CER33-25	33	.17
CER47-25	47	.18
CER100-25	100	.22
CER220-25	220	.35
CER330-25	330	.43
CER470-25	470	.55
CER1000-25	1000	.85
CER2200-25	2200	1.40
CER3300-25	3300	2.05
CER4700-25	4700	2.70

25 VOLT AXIAL LEAD

PART NO.	CAP. µF	PRICE EACH
CEA4.7-25	4.7	.29
CEA10-25	10	.29
CEA22-25	22	.35
CEA33-25	33	.46
CEA47-25	47	.46
CEA100-25	100	.59
CEA220-25	220	.75
CEA330-25	330	.98
CEA470-25	470	1.13
CEA2200-25	2200	1.57
CEA3300-25	3300	2.50
CEA4700-25	4700	3.30

250 VOLT RADIAL LEAD

PART NO.	CAP. µF	PRICE EACH
CER1-250	1	.40
CER2.2-250	2.2	.45
CER3.3-250	3.3	.50
CER4.7-250	4.7	.55
CER6.8-250	6.8	.60
CER10-250	10	.65
CER22-250	22	.90
CER33-250	33	1.60
CER47-250	47	1.95
CER100-250	100	2.95

250 VOLT AXIAL LEAD

PART NO.	CAP. µF	PRICE EACH
CEA1-250	1	.55
CEA2.2-250	2.2	.60
CEA3.3-250	3.3	.70
CEA4.7-250	4.7	.95
CEA10-250	10	.80
CEA22-250	22	1.40
CEA33-250	33	1.90
CEA47-250	47	2.40
CEA100-250	100	3.00

50 VOLT RADIAL LEAD

PART NO.	CAP. µF	PRICE EACH
CER.47-50	.47	.17
CER1-50	1	.17
CER2.2-50	2.2	.17
CER3.3-50	3.3	.17
CER4.7-50	4.7	.17
CER10-50	10	.17
CER22-50	22	.18
CER33-50	33	.22
CER47-50	47	.25
CER100-50	100	.36
CER220-50	220	.54
CER330-50	330	.70
CER470-50	470	.93
CER1000-50	1000	1.45
CER2200-50	2200	2.80

50 VOLT AXIAL LEAD

PART NO.	CAP. µF	PRICE EACH
CEA.47-50	.47	.29
CEA1-50	1	.29
CEA2.2-50	2.2	.29
CEA3.3-50	3.3	.29
CEA4.7-50	4.7	.35
CEA10-50	10	.48
CEA22-50	22	.48
CEA33-50	33	.48
CEA47-50	47	.48
CEA100-50	100	.59
CEA220-50	220	.99
CEA330-50	330	1.09
CEA470-50	470	1.35
CEA1000-50	1000	2.08
CEA2200-50	2200	3.95

350 VOLT RADIAL LEAD

PART NO.	CAP. µF	PRICE EACH
CER1-350	1	.45
CER2.2-350	2.2	.55
CER3.3-350	3.3	.70
CER4.7-350	4.7	.75
CER10-350	10	.90
CER22-350	22	1.40
CER33-350	33	2.10
CER47-350	47	2.70
CER100-350	100	5.15

350 VOLT AXIAL LEAD

PART NO.	CAP. µF	PRICE EACH
CEA1-350	1	.65
CEA2.2-350	2.2	.75
CEA3.3-350	3.3	.85
CEA4.7-350	4.7	1.05
CEA10-350	10	1.40
CEA22-350	22	1.95
CEA33-350	33	2.55
CEA47-350	47	2.70
CEA100-350	100	3.95

160 VOLT RADIAL LEAD

PART NO.	CAP. µF	PRICE EACH
CER1-160	1	.30
CER2.2-160	2.2	.35
CER3.3-160	3.3	.40
CER4.7-160	4.7	.45
CER10-160	10	.50
CER22-160	22	.80
CER33-160	33	1.10
CER47-160	47	1.40
CER100-160	100	2.75
CER220-160	220	3.75
CER330-160	330	4.95
CER470-160	470	5.95

160 VOLT AXIAL LEAD

PART NO.	CAP. µF	PRICE EACH
CEA1-160	1	.40
CEA2.2-160	2.2	.45
CEA3.3-160	3.3	.50
CEA4.7-160	4.7	.60
CEA10-160	10	.70
CEA22-160	22	.95
CEA33-160	33	1.40
CEA47-160	47	1.40
CEA100-160	100	2.20
CEA220-160	220	3.80
CEA330-160	330	5.05
CEA470-160	470	6.20

450 VOLT RADIAL LEAD

PART NO.	CAP. µF	PRICE EACH
CER1-450	1	.60
CER2.2-450	2.2	.70
CER3.3-450	3.3	.80
CER4.7-450	4.7	.90
CER10-450	10	1.20
CER22-450	22	2.30
CER33-450	33	3.40
CER47-450	47	3.70
CER100-450	100	5.90

450 AXIAL LEAD

PART NO.	CAP. µF	PRICE EACH
CEA1-450	1	.85
CEA2.2-450	2.2	.90
CEA3.3-450	3.3	.95
CEA4.7-450	4.7	1.35
CEA10-450	10	1.70
CEA22-450	22	2.60
CEA33-450	33	3.40
CEA47-450	47	3.75
CEA100-450	100	4.90

CERAMIC DISC CAPACITORS — RADIAL LEADS

50 VOLT
±20% GENERAL PURPOSE

PART NO.	CAP	1-99	100+
CD1-5	1PF	.15	.10
CD1.5-5	1.5PF	.15	.10
CD2-5	2PF	.15	.10
CD3-5	3PF	.15	.10
CD5-5	5PF	.15	.10
CD6-5	6PF	.15	.10
CD10-5	10PF	.15	.10
CD11-5	11PF	.15	.10
CD12-5	12PF	.15	.10
CD15-5	15PF	.15	.10
CD18-5	18PF	.15	.10
CD20-5	20PF	.15	.10
CD22-5	22PF	.15	.10
CD27-5	27PF	.15	.10
CD30-5	30PF	.15	.10
CD33-5	33PF	.15	.10
CD39-5	39PF	.15	.10
CD43-5	43PF	.15	.10
CD47-5	47PF	.15	.10
CD50-5	50PF	.15	.10
CD51-5	51PF	.15	.10
CD56-5	56PF	.15	.10
CD68-5	68PF	.15	.10
CD75-5	75PF	.15	.10
CD100-5	100PF	.15	.10
CD120-5	120PF	.15	.10
CD150-5	150PF	.15	.10
CD180-5	180PF	.15	.10
CD200-5	200PF	.15	.10
CD220-5	220PF	.15	.10
CD250-5	250PF	.15	.10
CD270-5	270PF	.15	.10
CD300-5	300PF	.15	.10
CD330-5	330PF	.15	.10
CD390-5	390PF	.15	.10
CD470-5	470PF	.15	.10
CD500-5	500PF	.15	.10
CD560-5	560PF	.15	.10
CD680-5	680PF	.15	.10
CD820-5	820PF	.15	.10
CD001-5	.001µF	.15	.10
CD002-5	.002µF	.15	.10
CD0047-5	.0047µF	.15	.10
CD005-5	.005µF	.15	.10
CD01-5	.01µF	.15	.10
CD02-5	.02µF	.15	.10
CD022-5	.022µF	.15	.10
CD047-5	.047µF	.15	.10
CD05-5	.05µF	.20	.15
CD104-5	.1µF	.20	.15

MONOLYTHIC CERAMIC
+/- 10% EPOXY DIPPED

FEATURES	APPLICATIONS
Small size	VHf Circuits
Stabilty	Bypassing
	General Purpose

PART NO.	CAP	1-99	100+
CM01	.01µF	.20	.15
CM047	.047µF	.25	.20
CM104	.1µF	.28	.23
CM224	.22µF	.40	.35
CM474	.47µF	.50	.45

100 VOLT
±5% GENERAL PURPOSE

PART NO.	CAP	1-99	100+
CD10-1	10PF	.20	.15
CD12-1	12PF	.20	.15
CD15-1	15PF	.20	.15
CD18-1	18PF	.20	.15
CD22-1	22PF	.20	.15
CD27-1	27PF	.20	.15
CD33-1	33PF	.20	.15
CD39-1	39PF	.20	.15
CD47-1	47PF	.20	.15
CD56-1	56PF	.20	.15
CD68-1	68PF	.20	.15
CD82-1	82PF	.20	.15
CD100-1	100PF	.20	.15
CD120-1	120PF	.20	.15
CD150-1	150PF	.20	.15
CD180-1	180PF	.20	.15
CD220-1	220PF	.20	.15
CD270-1	270PF	.20	.15
CD330-1	330PF	.20	.15
CD390-1	390PF	.20	.15
CD470-1	470PF	.20	.15
CD510-1	510PF	.20	.15
CD560-1	560PF	.20	.15
CD680-1	680PF	.20	.15
CD820-1	820PF	.20	.15
CD1000-1	1000PF	.20	.15

NPO 50V +/- 5%

PART NO.	CAP	1-99	100+
CD10N	10PF	.25	.20
CD12N	12PF	.25	.20
CD15N	15PF	.25	.20
CD18N	18PF	.25	.20
CD22N	22PF	.25	.20
CD27N	27PF	.25	.20
CD33N	33PF	.25	.20
CD39N	39PF	.25	.20
CD47N	47PF	.25	.20
CD56N	56PF	.25	.20
CD68N	68PF	.25	.20
CD82N	82PF	.25	.20
CD100N	100PF	.25	.20
CD120N	120PF	.25	.20
CD150N	150PF	.25	.20
CD180N	180PF	.25	.20
CD220N	220PF	.25	.20
CD270N	270PF	.25	.20

2000 VOLT ± 10% Y5P

PART NO.	CAP	1-99	100+
CD100-2K	100PF	.48	.36
CD120-2K	120PF	.48	.36
CD220-2K	220PF	.48	.36
CD300-2K	300PF	.48	.36
CD330-2K	330PF	.48	.36
CD390-2K	390PF	.48	.36
CD470-2K	470PF	.60	.40
CD680-2K	680PF	.60	.40
CD001-2K	.001µF	.80	.60
CD01-2K	.01µF	2.25	1.75

1000 VOLT
±10% GENERAL PURPOSE

PART NO.	CAP	1-99	100+
CD1-1K	1.0PF	.30	.25
CD1.5-1K	1.5PF	.30	.25
CD2.2-1K	2.2PF	.30	.25
CD3.3-1K	3.3PF	.30	.25
CD3.9-1K	3.9PF	.30	.25
CD4.7-1K	4.7PF	.30	.25
CD5.6-1K	5.6PF	.30	.25
CD6.8-1K	6.8PF	.30	.25
CD8.2-1K	8.2PF	.30	.25
CD10-1K	10PF	.30	.25
CD15-1K	15PF	.30	.25
CD22-1K	22PF	.30	.25
CD27-1K	27PF	.30	.25
CD33-1K	33PF	.30	.25
CD47-1K	47PF	.30	.25
CD100-1K	100PF	.30	.25
CD120-1K	120PF	.30	.25
CD150-1K	150PF	.30	.25
CD180-1K	180PF	.30	.25
CD220-1K	220PF	.30	.25
CD270-1K	270PF	.30	.25
CD330-1K	330PF	.30	.25
CD390-1K	390PF	.30	.25
CD470-1K	470PF	.30	.25
CD560-1K	560PF	.30	.25
CD680-1K	680PF	.30	.25
CD820-1K	820PF	.30	.25
CD001-1K	.001µF	.40	.35
CD0012-1K	.0012µF	.40	.35
CD0015-1K	.0015µF	.40	.35
CD0018-1K	.0018µF	.40	.35
CD0022-1K	.0022µF	.40	.35
CD0027-1K	.0027µF	.40	.35
CD0033-1K	.0033µF	.40	.35
CD0039-1K	.0039µF	.40	.35
CD0047-1K	.0047µF	.40	.35
CD0056-1K	.0056µF	.40	.35
CD0068-1K	.0068µF	.40	.35
CD0082-1K	.0082µF	.40	.35
CD01-1K	.01µF	.40	.35
CD015-1K	.015µF	.60	.55
CD022-1K	.022µF	.80	.75
CD033-1K	.033µF	.99	.94
CD036-1K	.036µF	1.19	1.10
CD047-1K	.047µF	1.19	1.10
CD05-1K	.05µF	1.24	1.19
CD104-1K	.10µF	1.39	1.30

HIGH VOLTAGE CERAMIC

PART NO.	CAP	VOLTS	PRICE
CD001-3K	.001µF	3000	1.05
CD002-3K	.002µF	3000	1.25
CD01-3K	.01µF	3000	1.70
CD100-4K	100PF	4000	.90
CD180-4K	180PF	4000	.90
CD120-5K	120PF	5000	.95

CAPS. – MICA, POLYSTYRENE & TANTALUM

DIPPED SILVER MICA 5% 500WVDC

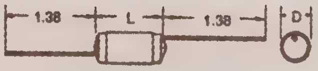
OPERATING TEMP.: -55°C TO +125°C

EXCELLENT STABILITY; IDEAL FOR HIGH FREQUENCY CIRCUITS

PART NO.	CAP	1-99	100+
CSM1	1PF	.55	.50
CSM2	2PF	.55	.50
CSM4	4PF	.55	.50
CSM7	7PF	.55	.50
CSM8	8PF	.55	.50
CSM10	10PF	.55	.50
CSM12	12PF	.55	.50
CSM15	15PF	.55	.50
CSM18	18PF	.55	.50
CSM22	22PF	.55	.50
CSM27	27PF	.55	.50
CSM30	30PF	.55	.50
CSM33	33PF	.55	.50
CSM36	36PF	.55	.50
CSM39	39PF	.55	.50
CSM43	43PF	.55	.50
CSM47	47PF	.55	.50
CSM51	51PF	.55	.50
CSM56	56PF	.55	.50
CSM60	60PF	.55	.50
CSM62	62PF	.55	.50
CSM68	68PF	.55	.50
CSM69.4	69.4PF	.55	.50
CSM75	75PF	.55	.50
CSM82	82PF	.55	.50
CSM100	100PF	.65	.60
CSM110	110PF	.65	.60
CSM120	120PF	.65	.60
CSM130	130PF	.65	.60
CSM150	150PF	.65	.60
CSM160	160PF	.65	.60
CSM170	170PF	.65	.60
CSM180	180PF	.65	.60
CSM220	220PF	.65	.60
CSM230	230PF	.65	.60
CSM240	240PF	.65	.60
CSM250	250PF	.65	.60
CSM260	260PF	.65	.60
CSM270	270PF	.65	.60
CSM280	280PF	.65	.60
CSM300	300PF	.65	.60
CSM320	320PF	.65	.60
CSM330	330PF	.65	.60
CSM340	340PF	.70	.65
CSM350	350PF	.70	.65
CSM370	370PF	.70	.65
CSM380	380PF	.70	.65
CSM390	390PF	.70	.65
CSM425	425PF	.70	.65
CSM470	470PF	.70	.65
CSM500	500PF	.70	.65
CSM510	510PF	.70	.65
CSM560	560PF	.70	.65
CSM680	680PF	.95	.90
CSM820	820PF	.95	.90
CSM910	910PF	.95	.90
CSM1000	1000PF	.95	.90

POLYSTYRENE 50 VOLT

- EXCELLENT ELECTRICAL CHARACTERISTICS
- HIGH RELIABILITY AND STABILITY
- LOW TEMPERATURE COEFFICIENTS
- SMALL DISSIPATION FACTOR
- HIGHLY RESISTANT TO HUMIDITY



CASE CODE	LGTH. x DIA.
A	.43 x .16
B	.43 x .17
C	.43 x .18
D	.43 x .19
E	.43 x .20
F	.43 x .22
G	.43 x .24
H	.55 x .26
J	.55 x .28
I	.55 x .30
K	.55 x .32

AXIAL LEAD

CASE DIMENSIONS (INCHES)

PART NO.	CAP.	CASE	1-99	100+
CPS100	100PF	A	.25	.20
CPS120	120PF	A	.25	.20
CPS150	150PF	B	.25	.20
CPS180	180PF	B	.25	.20
CPS220	220PF	C	.25	.20
CPS270	270PF	C	.25	.20
CPS330	330PF	C	.25	.20
CPS390	390PF	D	.25	.20
CPS470	470PF	D	.25	.20
CPS560	560PF	D	.25	.20
CPS680	680PF	E	.25	.20
CPS820	820PF	E	.25	.20
CPS001	.001µF	E	.30	.27
CPS0012	.0012µF	E	.30	.27
CPS0015	.0015µF	E	.35	.31

PART NO.	CAP.	CASE	1-99	100+
CPS0018	.0018µF	F	.35	.31
CPS002	.002µF	F	.35	.31
CPS0022	.0022µF	F	.35	.31
CPS0027	.0027µF	F	.35	.31
CPS0033	.0033µF	G	.35	.31
CPS0039	.0039µF	G	.35	.31
CPS0047	.0047µF	H	.35	.31
CPS005	.005µF	H	.37	.32
CPS0068	.0068µF	I	.37	.32
CPS0082	.0082µF	J	.37	.32
CPS01	.01µF	K	.40	.35

DIPPED TANTALUM CAPACITORS +/-20%

6.3 VOLT

P/N	CAP µF	1-99	100+
CT4.7-6	4.7	.29	.27
CT6.8-6	6.8	.32	.30
CT10-6	10	.40	.38
CT15-6	15	.48	.46
CT22-6	22	.56	.54
CT33-6	33	.68	.66
CT47-6	47	.80	.78
CT68-6	68	1.05	1.00
CT100-6	100	1.60	1.55
CT150-6	150	3.05	2.70

16 VOLT

P/N	CAP µF	1-99	100+
CT1.5-16	1.6	.27	.24
CT2.2-16	2.2	.28	.25
CT3.3-16	3.3	.29	.29
CT4.7-16	4.7	.40	.37
CT6.8-16	6.8	.48	.45
CT10-16	10	.56	.53
CT15-16	15	.70	.67
CT22-16	22	.84	.80
CT33-16	33	1.05	1.00
CT47-16	47	1.60	1.54
CT68-16	68	3.05	2.70

25 VOLT

P/N	CAP µF	1-99	100+
CT1.5-25	1.5	.29	.25
CT2.2-25	2.2	.32	.28
CT3.3-25	3.3	.40	.36
CT4.7-25	4.7	.52	.48
CT6.8-25	6.8	.62	.58
CT10-25	10	.97	.937
CT15-25	15	1.10	1.027
CT22-25	22	1.60	1.50
CT33-25	33	2.34	2.19

50 VOLT

P/N	CAP µF	1-99	100+
CT.1-50	.1	.29	.24
CT.15-50	.15	.29	.24
CT.22-50	.22	.29	.24
CT.33-50	.33	.29	.24
CT.47-50	.47	.30	.25
CT.68-50	.68	.36	.31
CT1-50	1	.48	.43
CT1.5-50	1.5	.80	.75
CT2.2-50	2.2	.99	.94
CT3.3-50	3.3	1.41	1.35
CT4.7-50	4.7	1.85	1.79
CT6.8-50	6.8	3.30	2.90

SOLID TANTALUM ELECTROLYTIC CAPACITORS PROVIDE HIGH STABILITY, GOOD HUMIDITY CHARACTERISTICS AND LONG LIFE. OPERATING TEMP. RANGE -55°C TO +85°C. SMALL SIZE, LIGHT WEIGHT.

HIGH VOLTAGE CAPACITORS

FEEDTHRU CAPACITOR

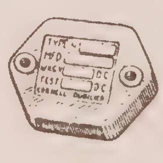
.001µF 500WVDC

Tiny ceramic for single hole mounting. Specifically designed for filters, interstage coupling and by-passing. Widely used in high frequency circuits. Rated 500WVDC. Mounts in 3/16" Dia. hole and solders to chassis. Tolerance ± 20% Popular .001µF (1000PF) value

CF-1000 .... **$1.00**

HI-VOLTAGE MICA CAP

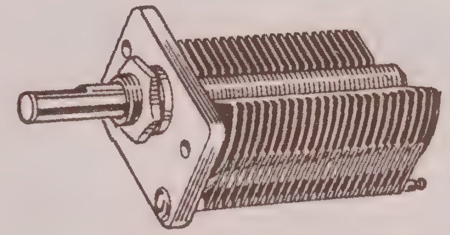
HIGH VOLTAGE TRANSMITTER CAP
.01µF 1200WVDC
2500 V TEST
6-32 THREADED BUSHINGS
ARE USED FOR MOUNTING AND TERMINALS.
FOR HIGH POWER TRANSMITTERS ETC.



CHV-01 .... **2.50**

VARIABLE CAPACITORS

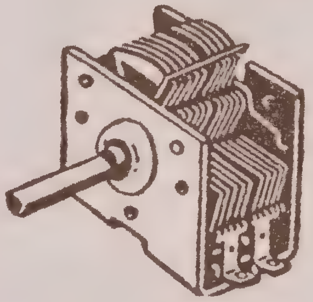
SMALL AIR VARIABLE CAPACITORS WITH 1/4" SHAFTS



Ideal for HAM's, Hobbyists, and experimenters. Used for building QRP gear, receivers, transmitters, test equipment, or small QRP tuners. Single hole panel mounting. Quality L4 grade ceramic. End shaft is insulated. Shaft is 1/4" Dia. X 1/2" Long. Air gap on plates is .016" and plates are rated 640V.

PART NO.	CAP (PF) MIN.	CAP (PF) MAX.	DIMENSIONS (IN) WIDTH X DEPTH X HEIGHT	PRICE
AVC25	3	25	1.41 X 1/2 X 1.03	10.50
AVC50	3.6	50	1.41 X 9/16 X 1.03	11.75
AVC75	4	75	1.41 X 11/16 X 1.03	12.50
AVC100	5	100	1.41 X 13/16 X 1.03	13.00
AVC150	6.4	150	1.41 X 1 X 1.03	14.25
AVC200	8	200	1.41 X 1 3/16 X 1.03	15.50
AVC250	9	250	1.41 X 1 3/8 X 1.03	16.25
AVC300	10	300	1.41 X 1 9/16 X 1.03	17.00

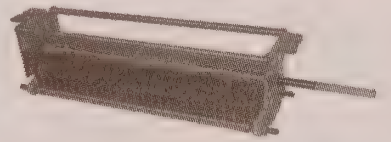
POPULAR 50PF AND 100PF SMALL AIR VARIABLES WITH BUILT IN VERNIER REDUCTION DRIVE.



Ideal for QRP rigs. Many QRP circuits, call for a small 50PF or 100PF air variable. These are ideal. Mounting is through tapped holes in the bottom, front, or rear of the frame or through the use of mounting studs. Vernier provides precision and smooth fine tuning. The Vernier drive provides a rotation ratio of about 8:1. That is a 360° rotation of the shaft, results in only a 45° movement of the rotor. Using a system of rolling balls rather then gears the Vernier creates little friction. Shaft is 1/4" Diameter x 3/4" Long. A quality capacitor. Air gap is .010" and rated 350V.

PART NO.	CAPACITANCE	SIZE	PRICE
AVC50VD	5-50PF	1 3/8"W x 1 5/16"H x 15/16"L	15.95
AVC100VD	6-100PF	1 3/8"W x 1 5/16"H x 15/16"L	15.95

BUILD THE PERFECT LEGAL LIMIT ANTENNA TUNER WITH THESE TWO LARGE AIR VARIABLE CAPACITORS

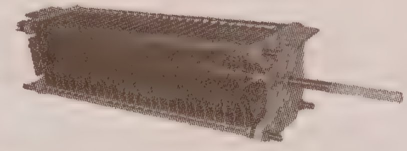


SINGLE GANG 250pF LARGE AIR VARIABLE

Large air variable for use in tuners. 250pf max. capacitance. Has 53 plates, with a spacing of .120 inch. Voltage breakdown is 3180 vrms. Frame dimensions are HEIGHT: 2.560" WIDTH: 2.625"1/280" MAXIMUM LENGTH: 10.17" 1/4" shaft.

Build your own legal limit antenna tuner.

VC-250 .... $69.95



TWO GANG 250pF SPLIT STATOR LARGE AIR VARIABLE

Large air variable for use in tuners. 250pf max./section capacitance. Has 26 plates and 27 stator plates per section, with a spacing of .120 inch. Voltage breakdown is 3180 vrms. Frame dimensions are HEIGHT: 2.560" WIDTH: 2.625" MAXIMUM LENGTH: 10.17" 1/4" shaft.

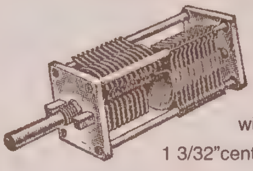
VC-2502 .... $79.95

Two Gang 30pF/Section Cardwell PL-6030

Made of nickel plated brass with 5/32" thick isolanite end plates. Capacitance 3-30pF per section. Measures 1-3/8"W x 2-1/4" D x 1-1/2" High. 1/4" Diameter shaft x 5/8" Long. Air gap .070". Applications include transmitters, amplifiers, receivers, more. Very nice two gang capacitor.MFG. Cardwell, P/N PL-6030

PL-6030.................................$24.95

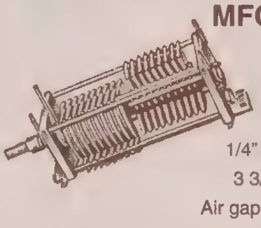
TWO GANG 50pF/SECTION MILLEN 23950



These capacitors have Steatite end plates 1 1/2" wide. Mounting studs are on 1 3/32"centers, shaft is 1/4" diameter, 1/2" long. Measures 1 1/2"W x5 3/4"D x 1 1/2"H. Capacitance 5-50pF per section. Voltage breakdown 2000V. Applications include transmitters, amplifiers, and receivers.

23950 .... $49.95

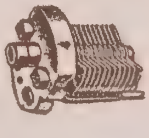
TWO GANG 25PF/SECTION MFG. EF JOHNSON



With steatite insulation and balanced rotors. Double end plates. 1/4" diameter shaft x 1/2" long. 3 3/4" L x 1 3/4" H x 1 3/4" W. Air gap 1/16" max voltage 2000V.

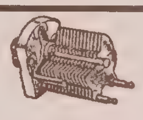
VC2525 .... $39.95

HAMMURLUND TYPE "APC" VARIABLE CAPACITORS



Silicone treated steatile. Straight line capacity. Adjust with screwdriver or socket wrench. Air gap 0.015". Tested 600V rms, 60 cycles. Size 15/16"W x 1 1/4"H.

PART NO./ TYPE	CAP (PF) MAX.	MIN.	DEPTH	PRICE
APC-25	25	3.0	1"	8.00
APC-35	35	3.3	1 1/16"	CALL
APC-50	50	3.9	1 1/8"	CALL
APC-75	75	4.6	1 1/4"	CALL
APC-100	100	5.5	1 5/16"	11.00
APC-140	140	6.7	1 1/2"	12.00



HAMMURLUND TYPE "MAPC"

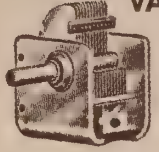
Scaled down "APC" construction. Silicone treated steatite base. Straight line capacity. Screwdriver or socket wrench adjustment. 0.0135" nominal air gap; tested 600V rms 60 Hz. Size: 3/4" W x 7/8" H.

PART NO./ TYPE	CAP (PF) MAX.	MIN.	DEPTH	PRICE
MAPC-10	10	1.5	1/2"	CALL
MAPC-35	35	2.9	7/8"	CALL
MAPC-50	50	3.2	1"	CALL
MAPC-75	35	3.9	1 1/8"	CALL
MAPC-100	100	4.5	1 1/2"	12.00

We are your source for air variable capacitors. Thousands in stock including 1, 2, 3, 4, & 5 gang types. Voltages to 5KV. We have straight line, differential, butterfly, and other types. All the old names like Hammurlund, EF Johnson, Millen, Bud, National, Cardwell, and others. Please visit our website www.oselectronics.com for variable capacitors not shown in our catalog. Prices for "CALL" items can be found on the website in most cases.

VARIABLE CAPACITORS

1 GANG BROADCAST VARIABLE CAPACITOR
14-365PF



The most popular Broadcast variable capacitor for use by amateurs, experimenters, and hobbyists. Ideally suited for building crystal radios, receivers, transmitters, or QRP tuners. Sturdy construction with aluminum plates, low loss bakelite insulation and ball bearing drive.

Specifications:

- Capacitance 14-365 PF
- 1/4" Diameter shaft 9/16" long
- Measures 1 3/8"W x 1 3/16"D x 1 5/16H

BC14400 .... $10.95

2 GANG VARIABLE CAPACITOR
8-300/9-170

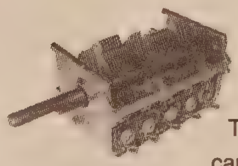
2 Gang Type includes Section 1 at 8-300PF which would be used in the RF section of a receiver and Section 2 at 9-170PF which is commonly used in the Oscillator section. Rugged construction with aluminum plates and low loss bakelite insulation, ball bearing drive.

Specifications:

- Capacitance 8-300PF Section 1
  9-170PF Section 2
- 1/4" Diameter shaft 7/16" long
- Measures 1 1/2"W x 2 3/16"D x 1 1/4H

BC08300 .... $26.95

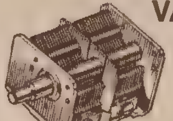
5 GANG VARIABLE CAPACITOR
(2) 10-30PF (1) 10-200PF
(1) 10-90PF (1) 7-27PF
THE CAPACITOR BARGAIN OF A LIFETIME



This versatile capacitor can be used for a variety of applications. Each section can be used separately or tied together for any desired capacitance. Tie all 5 sections together and you have a quality broadcast variable (377PF). Very well built. Compact size, measures only 1 1/4"W x 2"D x 1 1/8"H. 1/4" Diameter shaft 1" long. This is the Variable Capacitor to buy even if you don't need one now. A great value for this versatile capacitor.

BC5G $8.95

2 GANG BROADCAST VARIABLE CAPACITOR
14-380PF/14-380PF



2 Gang Type used for a variety of applications including AM/FM radios, shortwave radios, amateur gear, and test equipment. Sturdy aluminum plates with low loss bakelite insulation, ball bearing drive.

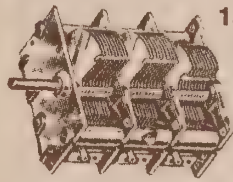
Tech-Tip: Need a high capacitance variable? Tie the 2 sections together for 760PF.

Specifications:

- Capacitance per section 13-380PF
- 1/4" Diameter shaft 3/4" long
- Measures 1 1/2"W x 2 1/8"D x 1 1/2H

BC13380 .... $22.95

3 GANG VARIABLE CAPACITOR
15/500 PF/SECTION
A Capacitor of truly universal application



Compact variable capacitor used in a variety of amateur and shortwave radios. Most often used in Superhet and T.R.F. radio circuits. Solid construction with heavy duty aluminum plates and low loss bakelite insulation, ball bearing drive shaft.

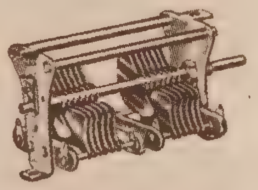
Tech Tip: Need a very high capacitance variable? Tie 2 sections together for 1000PF. Need higher? Tie 3 sections for 1500PF! Priced attractively low. This is an exceptional value for this type of capacitor.

Specifications:

- Capacitance 15-500PF Per Section
- Measures 1 3/4"W x 3 1/8"D x 1 1/2H
- 1/4" Diameter Shaft 1" long

BC15500 .... $22.95

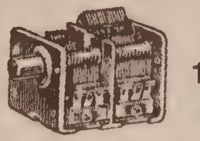
TWO GANG 50pF/SECTION LARGE AIR VARIABLE



A ruggedly built capacitor that will handle the demand of any linear amplifier. Plates spaced .125" will handle 4500 volts. Measures 4 1/4"W x 5 1/2" D x 4"H. Capacitance 15-50pF section. A great value at this price.

VC11095 .... $19.95

2 GANG VARIABLE CAPACITOR
BUILT IN VERNIER REDUCTION DRIVE!
10-365PF/10-210PF



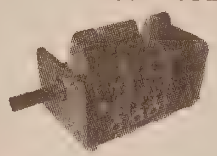
Smooth Planetary Reduction Drive with a 6 to 1 ratio. (6 full turns equals maximum capacitance) Ideal for Hams building small receivers where tuning of both the RF section and Oscillator section are needed. Quality built with aluminum plates and low loss bakelite insulation. Ball bearing drive.

Specifications:

- Capacitance 10-365PF Section 1
  10-210PF Section 2
- 1/4" Diameter shaft 1" long
- Measures 1 1/2"W x 2 1/8"D x 1 1/2H

BC10365 .... $29.95

4 GANG VARIABLE CAPACITOR
10-200 PF/SECTION
A Capacitor of truly universal application



Compact variable capacitor used in a variety of amateur and shortwave radios. Most often used in Superhet and T.R.F. radio circuits. Solid construction with heavy duty aluminum plates and low loss bakelite insulation, ball bearing drive shaft.

Tech Tip 1: Need a high capacitance variable? Tie 2 sections together for 400PF. Need higher? Tie 3 sections for 600PF. Need even higher? Tie 4 sections for 800PF.

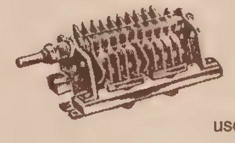
Tech Tip 2: Need broadcast band variable? Tie 2 sections together for (400PF). You will cover the broadcast band plus some!

Specifications:

- Capacitance 10-200PF Per Section
- Measures 1 3/4"W x 3 3/16"D x 1 9/16"H
- 1/4" Diameter Shaft 3/4" Long

BC10200 .... $19.95

TWO GANG 35pF/SECTION CARDWELL NP35ND



Widely used for 2, 6, and 10 meter transmitters. Also used in UHF power oscillators. Ruggedly built capacitor. Solid aluminum plates with Isolanite insulation capacitance 5 35PF per section. Measures 4 1/8"D x 2"H. Plates spaced .085".

NP35ND $19.95

TRIMMER CAPACITORS

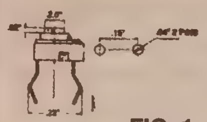


FIG. 1

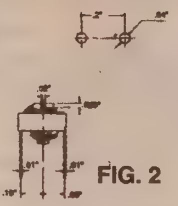


FIG. 2

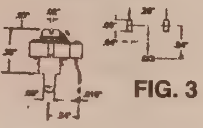


FIG. 3

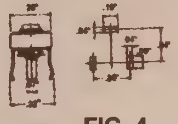
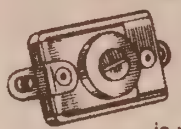


FIG. 4

PART NUMBER	FIG	SIZE MM	CAPACITY PF	WORKING VOLTS DC	Q FACTOR AT 10MHz	TEMP. COEFF. PPM/C°	ROTOR COLOR CODE	PRICE
TC-418	1	4	1.8-10	50	>300	N550±300	NONE	2.50
TC-428	1	4	2.8-20	50	>300	N550±300	BLUE	2.50
TC-440	1	4	4.0-30	50	>200	N1200±500	YELLOW	2.50
TC-518	2	5	1.8-6	200	>300	NPO±250	RED	1.70
TC-528	2	5	2.8-12.5	200	>300	N600±300	NONE	1.70
TC-535	2	5	3.5-20	200	>300	N750±300	BLUE	1.70
TC-550	2	5	5.0-30	200	>200	N1500±500	YELLOW	1.70
TC-590	2	5	9.0-50	200	>200	N1500±500	GREEN	1.85
TC-720	3	7	2.0-12	225	>300	NPO±200	NONE	1.80
TC-721	4	7	2.0-12	225	>300	NPO±200	NONE	1.80
TC-728	4	7	2.8-23	225	>300	N450±200	BLUE	1.80
TC-770	4	7	7.0-45	225	>200	N1400±800	BROWN	2.10
TC-755	4	7	7.0-55	225	>200	N1400±800	GREEN	2.10
TC-777	4	7	7.0-70	225	>200	N1400±800	GRAY	2.20
TC-712	4	7	12.0-100	225	200 AT 1MHz	N1400±800	BLACK	2.30

ARCO 40 & 46 SERIES TRIMMERS



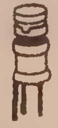
The most popular type of trimmer, especially used in old receivers and transmitters. The base is made of the lowest dielectric loss ceramic material and the mica is clear India Ruby. The soldering lugs may be bent in any position without affecting capacity setting due to the rigid construction of adjusting plates. Type 40 Series measures (including lugs) 3/8"W x 9/16"L x 9/16"H.

Type 46 Series measures (including lugs) 5/8"W x 3/4"L x 5/8"H.

PART NO.	CAPACITANCE (PF)	PRICE
TC-400	2-5-7	3.50
TC-402	4-20	3.50
TC-403	8-45	3.50
TC-404	12-65	3.50
TC-405	16-90	4.20
TC-406	25-115	4.40
TC-407	55-285	4.70
TC-408	90-340	4.80
TC-460	3.15	3.50
TC-461	5-30	3.50
TC-462	10-80	3.50
TC-463	20-180	3.70
TC-464	45-280	4.00
TC-465	75-380	4.20
TC-466	105-480	4.50
TC-467	140-580	4.60
TC-468	175-680	4.80
TC-469	215-790	5.20
TC-4610	260-900	5.50
TC-4611	300-1000	5.70
TC-4612	330-1100	5.90
TC-4613	360-1200	6.40
TC-4614	380-1300	6.90
TC-4615	420-1400	6.90

PISTON TRIMMER

3-LEG PC MOUNT

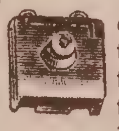


TCP-526	5-25 PF	Top Adjust

3/8" Dia. x 7/16" H $3.50

Many other piston type trimmer capacitors are stocked in quantities too small to catalog. Please call, write or e-mail with your requirements.

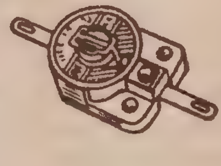
ARCO TYPE 30 TRIMMERS



The construction is such as to completely enclose and protect the delicate edges of the mica film. Same quality materials as type 40 & 46 Series.Measures 7/8"W x 5/16"H x 1 1/4"L (Incl. lugs)

PART NO.	CAP. (PF)	PRICE
TC-304	115-550	3.15
TC-306	275-970	3.25

CERAMIC TRIMMERS

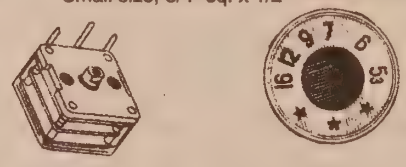


"NPO" type ceramic Trimmer is ideal for RF Circuits. Top adjust. 500WVDC. 2 hole mounting. 5/8"W x 7/8"D x 1/4"H

PART NO.	CAP. (PF)	PRICE
TC-0157	1.5-7	2.50
TC-0312	3-12	2.50

MINIATURE 2-GANG VARIABLE TUNING CAPACITOR FOR BROADCAST BAND

- Tunes 540KHz to 1600KHz
- Includes calibrated dial
- Small size; 3/4" sq. x 1/2"



Ideal variable tuning capacitor for miniature circuitry and use as exact-duplicate replacement in current transistor receivers. Rotates through a full 180° — maximum capacity: antenna section. 15-140PF, oscillator section, 10-60PF. Trimmer capacity: variable to over 12PF. Trimmer adjustment on rear of case. Completely enclosed to clear polyethylene plastic case to protect plates.

BC-540 .... $2.95

TUNING CAP FOR FM BAND

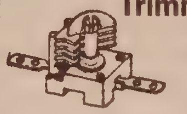
Same style as above but tunes both AM and FM bands. 540KHz-1600KHz and 88MHz to 108MHz.

AM	FM
OSC.10-74PF	OSC 14-23PF
ANT. 21-152PF	ANT. 23-44PF

Includes Calibrated Dial & Spec Sheet

BC-88 .... $3.95

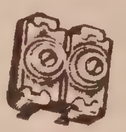
EF JOHNSON AIR VARIABLE
Trimmer Capacitors



Sub mini type. Approx. 7/16"SQ x 1/2"DEEP. .010" air gap rated. 750 volts breakdown.

PART NO.	CAP (PF)	JOHNSON P/N	PRICE
TC-0242	1.2-4.2	189-501-4	3.50
TC-1473	1.4-7.3	189-3	3.50
TC-1117	1.7-11	189-5	3.50
TC-2895	2.8-9.5	189-502-4	3.50

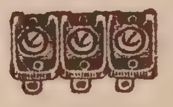
DUAL TYPE CERAMIC TRIMMERS



Hard to find, dual type trimmers have many uses in receivers, transmitters, etc. (TCD-150 Not Ceramic.)

PART NO.	CAP (PF)	SIZE	PRICE
TCD-160	25-160/25-160	1"W x 1"D x 3/8"H	3.75
TCD-240	240-350/240-350	1 1/8"/W x 1"D x 7/16"H	3.75
TCD-220	220-340/340-400	1"W x 11/16"D x 1/4"H	2.75
TCD-230	25-100/230-400	1"W x 3/4"D x 1/4"H	2.75
TCD-150	8-50/8-150	1"W x 7/8"D x 1/8H	1.75

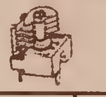
3 SECTION CERAMIC TRIMMER



Hard to find, 3 section type has (2) 25-150PF & (1) 30-425PF 1 1/2"L x 5/8"W x 3/16"H

TC-003 .... $2.95

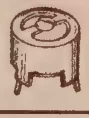
AIR VARIABLE PC MOUNT TRIMMERS



Small PC mount air variable trimmers. Slot adjust. approx. 7/16" SQ x 13/16"H.

PART NO.	CAP (PF)	MFG	MFG P/N	PRICE
TC-1492	1.4-9.2	Johnson	189-503-5	3.00
TC-1585	1.5-8.5	Sprague	GAI8R000	3.00
TC-1711	1.7-11	Johnson	187-106-005	3.00
TC-1341	1.3-4.1	Johnson	189-526-5	4.00

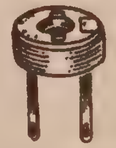
PC MOUNT TRIMMERS



Stable "NPO" type. Small size, 3/8"DIA. x 1/4"H. Top Adjust

PART NO.	CAPACITANCE (PF)	PRICE
TC-0420	4-20	2.75
TC-5518	5.5-18	2.75

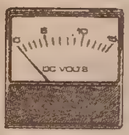
"BUTTON" TYPE TRIMMER



"NPO" Type, top adjust 5-30PF 1/2"Dia. x 1/4" H.
Excellent for most RF Circuits.

TC-0530 .... $1.50

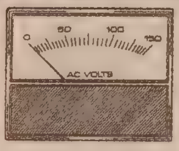
PANEL METERS AND COOLING FANS



1 5/8" SQUARE PANEL METERS

Clear plastic face, D'Arsonval type movement, 1 5/8" square face. Meters fit into 1 1/2" diameter hole in panel and are calibrated to be accurate within 2%. Has zero set screw adjustment. Will enhance the looks of any equipment on which it is used. Measures1 5/8" x 1 5/8" x 1 1/2" deep including terminals.

PART NO.	TYPE	METER READING	PRICE
60-150	AC VOLTS	0-15V	15.25
60-151	AC VOLTS	0-150V	15.25
60-152	DC VOLTS	0-15V	15.25
60-153	DC VOLTS	0-30V	15.25
60-154	DC VOLTS	0-200V	15.25
60-155	DC VOLTS	0-300V	15.25
60-156	DC VOLTS	0-500V	15.25
60-158	DC AMPS	0-1MA	15.25
60-159	DC AMPS	0-10MA	15.25
60-160	DC AMPS	0-100MA	15.25
60-161	DC AMPS	0-200MA	15.25
60-163	DC AMPS	0-500MA	15.25
60-165	DC AMPS	0-50µA	15.25
60-166	DC AMPS	0-100µA	15.25
60-167	DC AMPS	0-200µA	15.25
60-168	DC AMPS	0-500µA	15.25
60-172	DC AMPS	0-30A	15.25



3" FULL VIEW METER

Clear plastic face, D'Arsonval type movement, 3" x 1 5/8" square face Meters fit into 1 25/32" diameter hole in panel and are calibrated to be accurate within 2%. Has zero set screw adjustment. Will enhance the looks of any equipment on which it is used. size 3 1/8" x 2 1/2" x 1 5/8" deep including terminals.

PART NO.	TYPE	METER READING	PRICE
60-134	DC AMPS	0-1mA	18.75
60-136	DC VOLTS	0-15V	18.75
60-137	DC VOLTS	0-30V	18.75
60-140	AC VOLTS	0-150V	18.75
60-144	DC AMPS	0-50µA	18.75

EDGEWISE MOUNT S METER/SWR METER

Very popular edgewise mount panel meter used in hobby projects particulary suited for the QRP builder. Calibrated to read just signal strength (s meter) or combined signal strength and SWR reading.

MS200 meter features a 200µA movement meter with S meter scale. Meter measures approximately 1 1/2"W x 7/8"H x 1 1/4"D. Has ear holes for mounting.

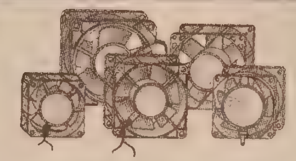
MS200 .... $4.95

Same as above but with combined SWR/S meter scale.

MW200 .... $4.95

ILLUMINATION KIT AVAILABLE FOR ALL 60 SERIES METERS ORDER # 60-149 .... $2.95

COOLING FANS



These cooling fans are used in electronic equipment, copiers, and computers. They are available in several voltages, sizes, and CFM (cubic feet per minute) air flow types. The fans are available with brushless AC or DC motors which are polarity protected.

Specifications:
Motor: AC or DC Brushless
Case & Impellers: 94V-0 Plastic
Operating Temp: -20° C - 80° C Ball Bearing
-10° C - 50° C Sleeve Bearing
Life Expectancy: 70,000 Hours
UL, CUL, CSA Approvals

PART NUMBER	VOLTAGE	SIZE	THICKNESS	MAX CFM	SPEED RPM	BEARING STYLE	NOISE db	CURRENT mA	price
70-4012	12V DC	40mm/1.56"	10mm/.394"	7.7	6500	sleeve	29	130	7.95
70-4128	12V DC	40mm/1.56"	10mm/.394"	7.7	6500	ball	29	130	10.45
70-6058	5V DC	60mm/2.36"	15mm/.591"	15	3900	ball	29	140	10.95
70-6128	12V DC	60mm/2.36"	15mm/.591"	15	3900	ball	28	140	10.95
70-6012	12V DC	60mm/2.36"	25mm/.985"	24	4000	sleeve	29	140	7.95
70-8275	12V DC	80mm/3.15"	25mm/.985"	29	3200	sleeve	34	190	8.95
70-8128	12V DC	80mm/3.15"	25mm/.985"	22	2000	ball	21	120	10.95
70-6275	120V AC	80mm/3.15"	25mm/.985"	24	3000	ball	28	140	18.95
70-8325	12V DC	92mm/3.62"	25mm/.985"	36	2400	sleeve	39	220	7.95
70-9128	24V DC	92mm/3.62"	25mm/.985"	50	3000	ball	33	180	11.95
70-6325	120V AC	92mm/3.62"	25mm/.985"	31	2900	ball	30	140	18.95
70-8415	12V DC	120mm/4.72"	25mm/.985"	69	2400	sleeve	35	340	11.95
70-1128	12V DC	120mm/4.72"	25mm/.985"	86	3000	ball	42	240	14.95
70-1248	24V DC	120mm/4.72"	25mm/.985"	86	3000	ball	42	240	14.95
70-6412	120V AC	120mm/4.72"	25mm/.985"	105	2900	ball	33	140	18.95

FAN GUARDS

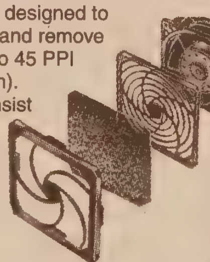
These guards are designed to fit the fans above as well as other standard models. They are to be used to keep foreign objects from interfering with the operation of the fan as well as for safety purposes.

Specifications:
Nickel Chrome Steel
Wire Welded Joints
Meets UL &
CSA Standards

Part NO.	Fan Size	Dia.	Dim. Mt. Centers	Price
70-6340	40mm	1.24"	1.26"	1.75
70-6360	60mm	1.97"	2.09"	1.75
70-6280	80mm	2.81"	3.02"	1.75
70-6330	92mm	3.25"	3.52"	1.75
70-6415	120mm	4.125"	4.31"	1.95

PLASTIC FAN FILTER KITS

These kits are designed to reduce noise, and remove impurities up to 45 PPI (Parts Per Inch). These kits consist of three parts. A fan guard, Media Filter, and a Retainer.

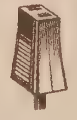


Specifications:
Guard: UL 94V-0 Plastic, UL .25 Spacing, Reduces Noise Level.
Media Filter: PU (polyurethane) Foam, 45 PPI, Easy to Clean.
Retainer: UL94V-0 Plastic, Low Air Resastance, Snap-on Installation

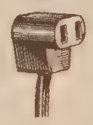
Part NO.	Fan Size mm	Price
70-5340	40mm	2.49
70-5360	60mm	2.95
70-5380	80mm	3.49
70-5392	92mm	3.95
70-5312	120mm	4.29

FAN POWER CORDS

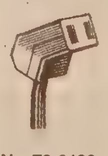
These fan power cords fit above models and other competitor fans with plug -in terminals. Several configurations for your convenience.



No. 70-6420
Straight 42"
$1.95



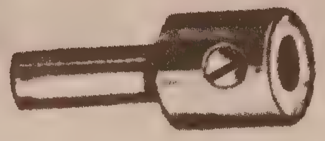
No. 70-6424
90° 24" long
$2.69



No. 70-6436
45° 36" long
$2.95

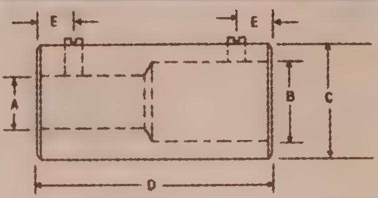
SHAFT ACCESSORIES

SHAFT EXTENDERS

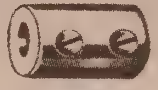


Hard to find shaft extenders can be used to couple a shaft to a dial. Available in Brass or Insulating Phenolic.

PART NO.	MATERIAL	SHAFT DIA.	SHAFT LENGTH	BODY LENGTH	BODY DIA.	PRICE EACH
S189	BRASS	1/8"	3/8"	1/4"	9/32"	2.80
S160	BRASS	1/4"	5/8"	1/2"	1/2"	3.60
S161	PHENOLIC	1/4"	5/8"	1/2"	1/2"	4.70
S150	BRASS	1/4"	1 1/4"	1/2"	1/2"	3.60
S130	PHENOLIC	1/4"	1 1/4"	1/2"	1/2"	4.70



SHAFT COUPLERS



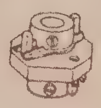
For coupling shaft to shaft. Various configurations available. Brass, nickel plated material.

PART NO.	A INSIDE DIA.	B INSIDE DIA.	C OUTSIDE DIA.	D LENGTH	E SCREW LOCATION	NO. SCREWS	PRICE EACH
SC120	1/4"	1/4"	7/16"	3/4"	3/16"	2	2.70
SC138	1/4"	1/4"	7/16"	3/4"	3/16"	4	6.90
SC131	1/4"	3/8"	1/2"	3/4"	3/16"	2	2.70
MINIATURE COUPLER - BRASS NICKEL PLATED							
SC180	1/8"	1/8"	9/32"	3/8"	5/64"	4	2.20
PHENOLIC - INSULATED COUPLER							
SC140	1/4"	1/4"	7/16"	3/4"	3/16"	2	3.75

SC39006
CALL

SC39002
CALL

SC39016
$12.95

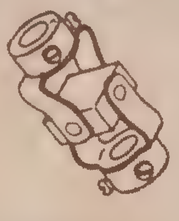


SC21116
$9.95

SHAFT COUPLERS FOR 1/4" SHAFTS

SC39006	Steatite Insulated Coupler	13/16" Square x 5/8" Deep	Rated 2000 Volts
SC39002	Steatite Flexible Coupler	7/8" Square x 7/8" Deep	Rated 3000 Volts
	Ideal where shafts centers are not in complete alignment.		
SC39016	High Voltage Phenolic Material	1 3/16" Dia. x 1/2" Deep	Rated 4000 Volts
SC21116	Miniature Nylon Coupler	11/16" Dia x 9/16" Deep	Rated 1000 Volts

UNIVERSAL SHAFT COUPLINGS

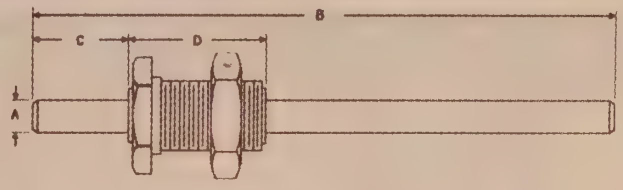


39005 SHOWN

Ideal for offset situations. Couples two 1/4" shafts. Model SC39001 is steatite insulated for high voltage (4000V) applications. SC39005 is all metal and used in non high voltage applications. Both units utilize a universal joint that can offset up to 90°. Both measure 1 5/16"L x Aprox. 3/4" Diameter. **LIMITED QUANTITY**

SC39001 INSULATED .... CALL
SC39005 UNINSULATED .... CALL

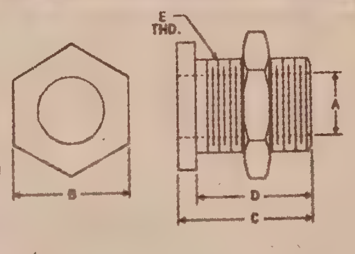
SHAFT EXTENTIONS WITH BUILT IN PANEL BEARING



Brass, nickel plated.
Has built in panel bearing nut supplied.

PART NO.	A SHAFT DIA.	B OVERALL LENGTH	C SHAFT LENGTH	D BODY LENGTH	THREAD SIZE	PRICE EACH
SE1448	1/8"	2"	11/32"	7/16"	1/4 - 32	4.80
SE1449	1/8"	4"	11/32"	7/16"	1/4 - 32	5.40
SE148	1/4"	3"	1/2"	1/2"	3/8 - 32	4.70
SE149	1/4"	6"	1/2"	1/2"	3/8 - 32	5.40

PANEL BEARINGS

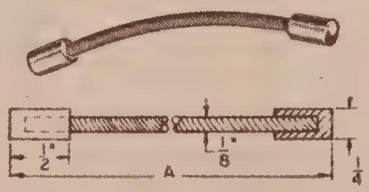


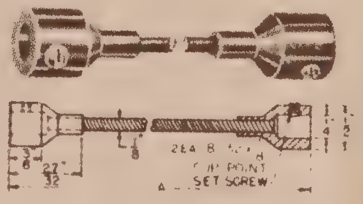
Brass, Nickel plated supplied with hex nut. Provides a smooth, accurate guide for shafts cut through a chassis panel.

PART NO	FOR SHAFT SIZE	DIMENSIONS A I.D.	B HEX	C LGTH	D BODY	E THREAD	PRICE
PB184	1/8" Miniature	.128	11/32	7/16	3/8	1/4-32	1.35
PB119	1/4"	.253	7/16	1/2	7/16	3/8-32	1.45

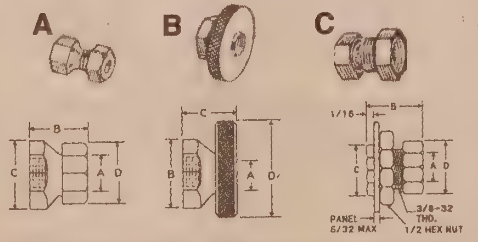
FLEXIBLE SHAFTS

Excellent for connecting shafts which are not in line. High quality phosphor bronze non-magnetic, non-rusting flexible shafts. Remote control when necessary to mount capacitors and potentiometers away from panel at unusual angles. Turns at any angle up to 90°, free from back lash.





PART NO.	LENGTH	TYPE	PRICE
FS151	3"	WITH 1/4" HUB	11.30
FS152	6"	WITH 1/4" HUB	12.90
FS154	6 5/8"	WITH 1/4" COUPLER	13.50



SHAFT LOCKS Materal: Brass, Nickel Plated

Part No.	Price	Illus.	For Shaft Size	Dimensions A	B	C	D	Thread Size
Bushing Mount								
181	2.40	A	1/4	.253	1/2	1/2	7/16	3/8-32
182	3.60	B	1/4	.253	1/2	1/2	1	3/8-32
183	2.40	A	1/8	.128	1/2	11/32	5/16	1/4-32
Panel Mount								
114	2.40	C	1/4	.253	1/2	7/16	7/16	3/8-32

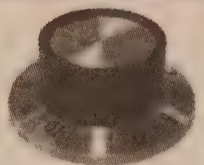
KNOBS, VERNIER DIALS, AND REDUCTION DRIVE

Large black fluted with white line on top.
2" Dia. x 3/4 H
Nice knob for a tuner.

KN-2134...$3.95

Straight Knurl 0-9 numbers on aluminum skirt.
1.15" Dia. x .70"H
Black with aluminum top inlay.

KN-3020...$2.55


Straight Knurl 0-10 numbers on aluminum skirt.
1.46" Dia. x .60"H
Black with aluminum top inlay.

KN-3045...$2.85

Fluted with skirt indicator line on top.
Measures .75" Dia. x .50"H
Black color

KN-3010...$1.55

Classic pointer knob with white indicator line on top.
Black color.
1-1/4"L x 1/2"W

KN-7114...$0.65

Fluted grip with indicator line. Black with aluminum inlay.
.92" x .62"H

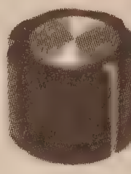
KN-3030...$1.85

Straight knurl pointer indicator line on side pointer.
.54" Dia. x .48"H.
Black with aluminum inlay

KN-3060...$1.55

Black with brushed aluminum skirt and black indicator arrow.
Knurled grip.
1-3/8" Dia. x 9/16"H

KN-3370...$1.95


Fluted grip with indicator line. Black with aluminum inlay.
.60" Dia. x .46"H.

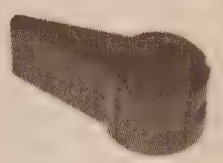
KN-3025...$1.55

Fluted with taper skirt indicator line on top.
.94"Dia. X .50"H
Color Black

KN-3035...$1.55

Control pointer knob with indicator on top and side.
1" Dia x .60"H
Color Black

KN-3050...$1.85


Large black wide pointer knob. Ideal for control instruments.
1 5/8"L x 3/4"W at round section.

KN-1583...$2.60

Large black control knob with white indicator line.
1 1/2" Dia. x 5/8"H

KN-1575...$2.80

Rectangular pointer with white indicator line. 1 1/2"L x 3/4"W

KN-1510...$2.40

Ribbed with skirt indicator line.
Black with aluminum top inlay.
1 1/2" Dia. x 3/4"H.
Very Nice Knob.

KN-3150...$2.85

ORIGINAL NOS ANTIQUE KNOB
Black bakelite knob. Found on many old radio receivers.
1-5/8" Dia. x 5/8"H

KN-1515...$7.95

ORIGINAL NOS ANTIQUE KNOB
Black bakelite skirted knob. Found on many older radio receivers.
Body 1" Dia x 9/16"H
Skirt 1-1/2" Dia

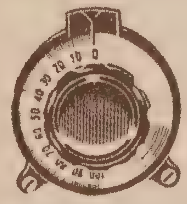
KN-1412...$6.95

Shaft Reducer
Reduce shaft diameter from 1/4" to 1/8".

K28-600...$1.95

ALL KNOBS FOR MOUNTING ON 1/4" SHAFTS: SEE OUR WEBSITE FOR MANY MORE TYPES OF KNOBS

VERNIER DIALS

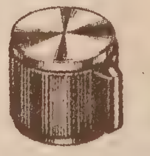


SURFACE MOUNTING FOR 1/4" SHAFT. PLANETARY DRIVE, RATIO APPROXIMATELY 8 TO 1. DIAL CALIBRATED 180°. IDEAL FOR QRP RECEIVERS AND TRANSMITTERS

PART NO.	DIA	READING	PRICE
VD112-10	1 1/2"	0-10	11.95
VD112-100	1 1/2"	0-100	12.95
VD2	2"	0-100	13.95

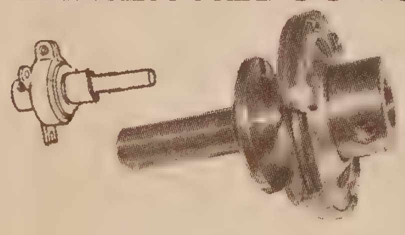
COLORED KNOBS

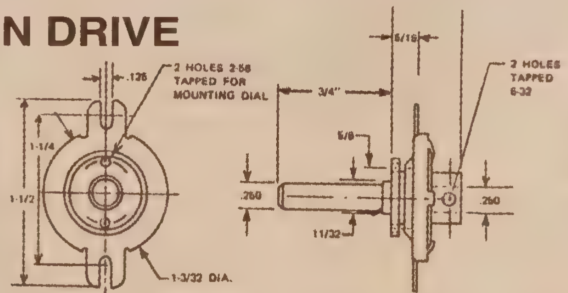
THESE WELL CONSTRUCTED KNOBS HAVE BRASS INSERTS AND METAL SET SCREWS FOR 1/4" SHAFTS. FOR EASE OF HANDLING THE KNOBS ARE BLACK SERRATED TO THE DOME WHERE THE VARIOUS COLORS APPEAR.



SIZES	YELLOW	BLUE	GREEN	PRICE
SMALL 1/2" DIA.	K2052-YW	K2052-BE	K2052-GN	1.50
MEDIUM 5/8" DIA.	K2053-YW	K2053-BE	K2053-GN	1.55
LARGE 3/4" DIA.	K2054-YW	K2054-BE	K2054-GN	1.70

VERNIER REDUCTION DRIVE





AMERICAN MADE 6:1 VERNIER DRIVE. HAS DIAL PLATE MOUNTING FLANGE WITH TWO TAPPED HOLES (2-56) FOR DIAL MOUNTING. INPUT AND OUTPUT MATE WITH 1/4" SHAFTS. USED ON ANTENNA TUNERS, QRP RIGS, RECEIVERS, TRANSMITTERS AND LINEARS.

INPUT TORQUE: 3 IN/OZ. MAXIMUM
OUTPUT TORQUE: 30 IN/OZ. MINIMUM

VD61 .... $9.95

SCREWS, HARDWARE, & CABLE TIES

MACHINE SCREWS — ROUND HEAD

AVAILABLE IN STEEL OR NYLON

PART NO.	THREAD SIZE X L	MATERIAL	25 PACK	100 PACK
16-14S	2/56 x 1/4"	Steel	AVAILABLE 100 PACK ONLY	3.50
16-12S	2/56 x 1/2"	Steel		3.50
17-14S	4/40 x 1/4"	Steel		2.50
17-38S	4/40 x 3/8"	Steel		2.95
17-12S	4/40 x 1/2"	Steel		2.50
17-34S	4/40 x 3/4"	Steel		2.50
20-14S	6/32 x 1/4"	Steel		2.25
20-12S	6/32 x 1/2"	Steel		2.30
20-34S	6/32 x 3/4"	Steel		2.35
20-10S	6/32 x 1"	Steel		2.40
20-20S	6/32 x 2"	Steel		3.50
18-14N	2/56 x 1/4"	Nylon	1.40	4.67
18-12N	2/56 x 1/2"	Nylon	1.40	4.67
18-34N	2/56 x 3/4"	Nylon	1.80	5.90
18-10N	2/56 x 1"	Nylon	1.90	6.05
19-14N	4/40 x 1/4"	Nylon	1.95	5.60
19-12N	4/40 x 1/2"	Nylon	1.95	5.60
19-34N	4/40 x 3/4"	Nylon	1.95	5.60
19-10N	4/40 x 1"	Nylon	1.80	5.90
21-14N	6/32 x 1/4"	Nylon	1.85	5.80
21-38N	6/32 x 3/8"	Nylon	1.85	5.80
21-12N	6/32 x 1/2"	Nylon	1.85	5.80
21-58N	6/32 x 5/8"	Nylon	1.85	5.80
21-34N	6/32 x 3/4"	Nylon	1.85	5.80
21-10N	6/32 x 1"	Nylon	2.25	6.90

HEX NUTS — STEEL or NYLON

PART NO.	THREAD	MATERIAL	100 PACK
HN256S	2/56	Steel	1.85
HN440S	4/40	Steel	1.95
HN632S	6/32	Steel	2.05
HN256N	2/56	Nylon	5.50
HN440N	4/40	Nylon	5.50
HN632N	6/32	Nylon	5.50

FLAT WASHERS — STEEL or NYLON

PART NO.	SCREW SIZE	MATERIAL	100 PACK
FW2S	#2	Steel	2.70
FW4S	#4	Steel	2.80
FW6S	#6	Steel	3.00
FW2N	#2	Nylon	2.20
FW4N	#4	Nylon	2.15
FW6N	#6	Nylon	2.50

SPLIT WASHERS — STEEL

PART NO.	SCREW SIZE	MATERIAL	100 PACK
SW4S	#4	Steel	1.60
SW6S	#6	Steel	1.65
SW8S	#8	Steel	1.80

INTERNAL LOCK WASHERS — STEEL

PART NO.	SCREW SIZE	MATERIAL	100 PACK
LW2S	#2	Steel	3.30
LW4S	#4	Steel	3.05
LW6S	#6	Steel	3.10

SWITCH & CONTROL MOUNTING NUTS

These nuts are nickel plated brass and are used on controls, switches, capacitors, potentiometers, etc.

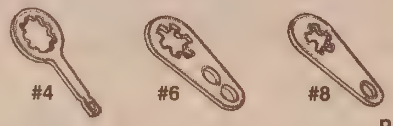
10-133	3/8-32 x 1/2 x 3/32"	$2.15/BOX 50
10-137	15/32-32 x 9/16 x 5/64"	$3.15/BOX 50

KNURLED DRESS NUT

These nuts are nickel plated brass and are used on controls, switches, capacitors, potentiometers, etc.

10-135	15/32-32 x 5/8"	$.29 EA

LOCKWASHER SOLDER LUGS



PART NO.	SIZE	PRICE BOX 50
10-487	#4 x 7/8"	3.90
10-479	#6 x 7/8"	4.20
10-480	#8 x 7/8"	4.20

HOLE AND VENT PLUGS

ALL NYLON
BLACK MATTE
FINISH

HOLE PLUG

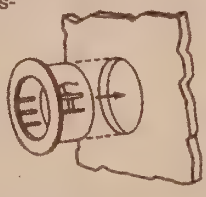
PART NO.	HOLE SIZE	PRICE/ 10 PK
HP-250	.250"	1.20
HP-375	.375"	1.25
HP-500	.500"	1.30
HP-625	.625"	1.35
HP-750	.750"	1.80
HP-875	.875"	1.90
HP-100	1.000"	1.95

VENT PLUG

PART NO.	HOLE SIZE	PRICE/ 10 PK
VP-875	.875"	1.50
VP-100	1.000"	1.55

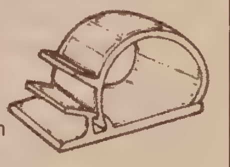
SNAP BUSHINGS

Black nylon snap bushings lock into holes with fingertip pressure.



PART NO.	MTG. HOLE	PRICE EACH
SB-875	.875"	.24
SB-1093	1.125"	.24
SB-1375	1.375"	.33
SB-1750	1.750"	.49
SB-2000	2.0"	.70

LOCKING SELF-ADHESIVE CABLE CLAMPS



- Adhesive mounting system
- Quick lock/release feature
- Flame resistant PVC copolymer
- Black

PART NO.	I.D.	PRICE/10 PACK
LAC-2	1/4"	2.05
LAC-4	1/2"	2.70
LAC-6	3/4"	4.75

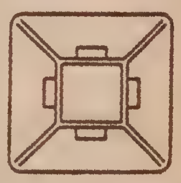
CABLE TIES

100% nylon cable ties are tough, resistant to temperature extremes, diluted acids, solvents, and grease. Easy application by hand or tool. Color: Natural. Tensile strength 50Lbs except 13-2004 which is 18Lbs.

PART NO.	LENGTH	MAX BUNDLE DIA.	PRICE 100	PRICE 1000
13-2004	4"	1"	1.79	9.99
13-2006	6"	1 1/2"	2.79	17.99
13-2007	7"	1 15/16"	3.69	28.99
13-2008	8"	2 5/32"	3.69	29.99
13-2011	11"	3 5/32"	6.49	42.99
13-2145	14 1/2"	4"	7.92	51.99

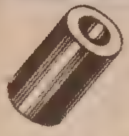
CABLE TIE MOUNTING CRADLES

A convenient way to mount cable ties. Furnished with adhesive backing to allow cradle to be attached to any smooth surface



PART NO.	SIZE	PRICE/25
CTM5	.50" x .50"	3.38
CTM8	.83" x .83"	3.58
CTM1	1.10" x 1.10"	4.78

SPACERS, FEET, GROMMETS, & FIBER WASHERS

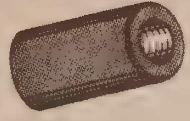


NYLON SPACERS

Tough and resiliant, nylon spacers are useful for many applications. Ideal for assembly uses, they can also be used as bushing, bearings, rollers and guides.

1/4" OUTSIDE DIAMETER

PART NUMBER	SCREW SIZE	LENGTH INCHES	PRICE 1-99	PRICE 100 PACK
14-210	4	1/4	.11	9.16
14-210A	4	3/8	.11	9.16
14-210B	4	1/2	.11	9.16
14-210C	4	3/4	.13	11.00
14-210D	4	1	.15	13.85
14-211	6	1/4	.11	9.16
14-211A	6	3/8	.11	9.16
14-211B	6	1/2	.11	9.16
14-211C	6	3/4	.13	11.00
14-211D	6	1	.15	13.85
14-212	8	1/4	.11	9.16
14-212A	8	3/8	.11	9.16
14-212B	8	1/2	.11	9.16
14-212C	8	3/4	.13	11.00
14-212D	8	1	.15	13.85



ROUND THREADED SPACERS (ALUMINUM)

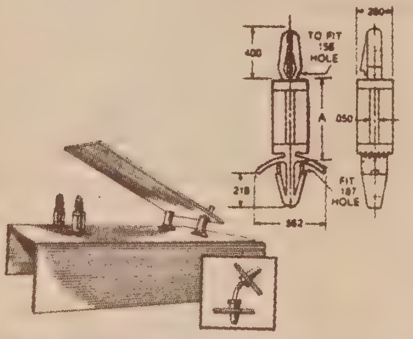
Threaded spacers 1/4" O.D. threaded 4-40, 6-32, 8-32.

PART NO.	THREAD	LENGTH	PRICE 1-99	PRICE 100 PACK
SP414	4/40	1/4"	.34	26.15
SP438	4/40	3/8"	.26	19.85
SP412	4/40	1/2"	.28	21.50
SP434	4/40	3/4"	.29	21.90
SP410	4/40	1"	.65	53.80
SP614	6/32	1/4"	.26	19.85
SP638	6/32	3/8"	.29	21.90
SP612	6/32	1/2"	.23	18.50
SP634	6/32	3/4"	.39	32.10
SP610	6/32	1"	.47	36.90
SP814	8/32	1/4"	.36	27.70
SP838	8/32	3/8"	.37	28.10
SP812	8/32	1/2"	.31	24.60
SP834	8/32	3/4"	.34	26.15
SP810	8/32	1"	.63	49.70

PRINTED CIRCUIT BOARD SUPPORTS

Printed circuit board supports replace expensive metal spacers for mounting PC Board to the chassis. They are easily installed by hand, into a .187" punched or drilled hole and may be removed for repair or replacement. The positive tensioning lock-springs also provide for varying chassis thickness. For accurate spacing between shassis and PC Board add .100 to "A" dimension.

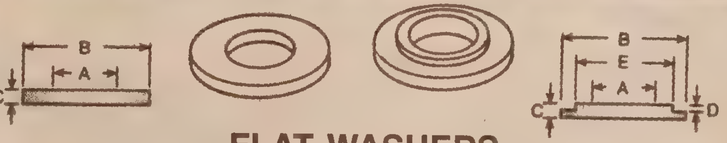
These supports are made of high dialectric strength nylon type 6/6.



PART NO.	DIA. A	PRICE 25	PRICE 100
700-3	3/16"	2.20	6.99
700-4	1/4"	2.50	7.99
700-6	3/8"	2.65	8.48
700-8	1/2"	2.95	9.49
700-10	5/8"	3.05	9.69
700-12	3/4"	3.45	10.99
700-14	7/8"	3.60	11.49
700-16	1"	3.75	11.99

Add "C" to part numbers when ordering 100 packs.

FIBER WASHERS



FLAT WASHERS

PART NO.	SCREW SIZE	DIMENSIONS (IN.) A	B	C	PRICE 1-99	PRICE 100 PACK
FW4	4	.110	.250	1/16	.06	2.80
FW6	6	.140	.375	1/16	.06	2.80
FW8	8	.172	.375	1/16	.06	2.80
FW10	10	.196	.375	1/16	.06	2.80
FW14	1/4	.250	.500	1/16	.07	3.20
FW38	3/8	.385	.625	1/16	.07	3.80

SHOULDER WASHERS

PART NO.	SCREW SIZE	DIMENSIONS (IN.) A	B	C	D	E	PRICE 1-99	PRICE 100 PACK
FSW 4	4	.115	.250	.062	.031	.187	.12	6.40
FSW6	6	.140	.375	.093	.031	.240	.09	6.40
FSW8	8	.170	.375	.093	.031	.246	.11	6.40
FSW10	10	.194	.375	.093	.031	.308	.09	6.40
FSW14	1/4	.253	.500	.093	.031	.308	.10	6.40
FSW38	3/8	.385	.625	.093	.031	.498	.13	7.60

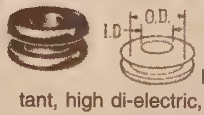
MINIMUM PURCHASE OF 10 PIECES EACH REQUIRED.

FEET, GROMMETS & CABLE CLAMPS

RUBBER FEET

For mounting on all types of Electronic Equipment. Prevents vibration and protects surfaces under equipment from being marred.

PART NO.	DIA.	HEIGHT	MTG. HOLE	PRICE
RF101	1/2"	1/4"	1/8"	.30
RF102	3/4"	1/4"	1/8"	.35
RF103	7/8"	3/8"	1/8"	.55
RF104	5/8"	1/4"	1/8"	.35
RF105	3/4"	7/16"	1/8"	.55
RF106	15/16"	5/16"	1/8"	.65

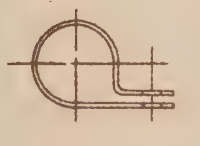


VINYL GROMMETS

Inexpensive flexible, oil-resistant, high di-electric, black vinyl grommet with outstanding aging qualities. Packaged in all popular sizes from 1/8" I.D. thru 11/16" I.D.

PART NO.	I.D.	MTG. HOLE SIZE	PRICE
GV-1/4	1/8"	1/4"	.08
GV-5/16	3/16"	5/16"	.10
GV-3/8	1/4"	3/8"	.10
GV-7/16	5/16"	7/16"	.12
GV-1/2	3/8"	1/2"	.13
GV-5/8	1/2"	5/8"	.17
GV-7/8	5/8"	7/8"	.27
GV-1	11/16"	1"	.35

NYLON CABLE CLAMPS

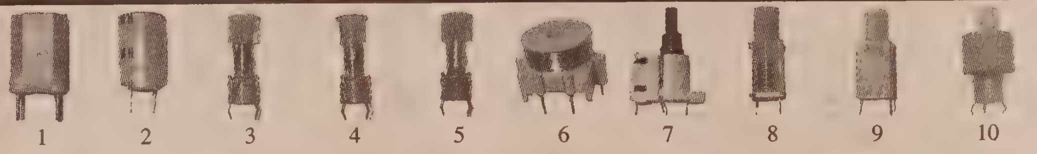


A durable nylon cable clamp that is tough, reisists acid and will with stand temperatures up to 135° F. Natural nylon color.

PART NO.	SIZE	10 PCS MIN PRICE
CCN-1	1/8"	.05
CCN-2	3/16"	.05
CCN-3	1/4"	.05
CCN-4	5/16"	.05
CCN-5	3/8"	.06
CCN-6	1/2"	.06
CCN-7	5/8"	.06
CCN-8	3/4"	.09
CCN-9	7/8"	.10
CCN-10	1"	.11

EXPERIMENTER ITEMS

An assortment of items for the Experimenter and Hobbyist priced below normal resale prices. Most of the items are one of a kind we purchase from various manufacturer's close outs. So stock up your parts bin for those winter projects. Some really great buys here, especially the copper clad boards, thumbwheel switches and coils and chokes. Check out our web site at www.oselectronics.com for many more special buys not shown in our catalog.

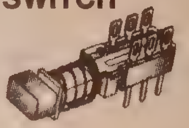


COILS & CHOKES

Stand up type (as shown in picture) Coils & Chokes. Available adjustable or fixed. Priced low enough for the experimenter and hobbyist. Most are hard to find types.

PART NO.	FIGURE NO.	INDUCTANCE	SIZE	PRICE
CL23M	1	23MH	3/8"W x 3/8"Dia. x 1/2"H	.40
CL47M	2	47MH	3/8"Dia. x 5/8"H	.40
CL20U	3	14µH - 28µH	.387"Dia. x 1"H	.30
CL62U	4	50µH - 80µH	.387" Dia. x 1"H	.30
CL10U	5	9µH - 11µH	.387"Dia. x 1"H	.30
CL73M	6	73MH	15/16"W x 1/2"H	.40
CL10H	7	10µH	1 1/2"W x 1 1/2"H	.40
CL023	8	.22µH - .287µH	1/2"Dia. x 1"H	.30
CL069	9	.064µH - .069µH	.4"W x 1"H	.30
CL205M	10	20MH + 5MH (DUAL)	5/8"DIA. x 1 1/4"H	.50

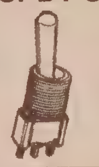
PUSH BUTTON SWITCH



DPDT Switch has PC Terminals on bottom and solder terminals on top. ON/OFF Action. Includes orange push button. Overall dimensions 1 3/4"L x 3/8"W x 1/4"H.

SW149 ....$.75

SPDT SWITCH



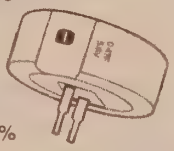
ON-OFF-ON 3A, 250VAC Miniature type toggle switch has full size handle. 1/2"W x 1/4"D x 7/8"H. Includes hardware

SW3250 ....$1.50

MEMORY BACK-UP CAPACITOR

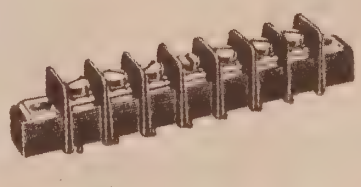
Features:

- Small size, large capacitance
- For memory back up in electronic devices
- Minimum self-discharging
- Wide temperature range: -25°C to +70°C
- Capacitance tolerance: ±20%
- Capacitance: .47 Farads
- Voltage: 5.5 Volts
- Measures 13/16" Dia. x 7/16" High



NEC47 .... $2.50

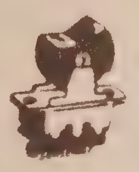
TERMINAL BLOCK



Feature interposing barriers between terminals to boost electrical ratings and provide added protection against frayed wire shorting. Binder head screws, flow solder terminations.

TS71525 .... $.50

ROCKER SWITCH

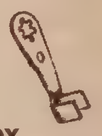


DPDT Rocker switch.
4A, 125VAC.
PC or Chassis mount
Blue rocker.

SW4125 $.50

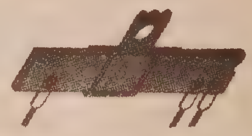
STEEL TERMINAL LUG

Wing type lug.
Locks wire firmly in place.
Accepts No. 6 screw.
100 pcs. per box.



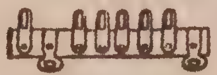
TL-2108 $2.50/box

100K SLIDER POT



PSS100K .... $.79

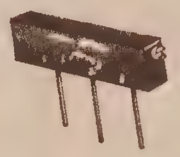
6 LUG TIE POINT



Plated steel lugs on bakelite material.
3"L x 11/16"H

TS63 .... $.30

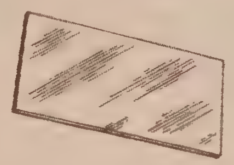
MULTI-TURN TRIM POT



100K OHMS
1 1/4"L x 5/16"H x 3/16"W

TP100KRJ $.40

COPPER CLAD PC BOARDS



Phenolic Base
1oz. Copper

5" x 7" Single Sided

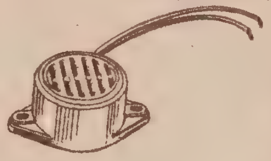
PC5X7SS $1.50

3" X 6" Double Sided

PC3X6DS $1.25

12 VDC BUZZER

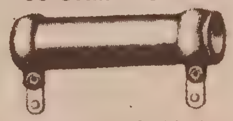
APPLICATIONS: Alarm clock, electronic tachometer, electronic cash registar, telephone, timer, automobile electronics, toys, portable battery operated equipment, computer peripherals. Measures 7/8" dia X 11/16" high. Mounting flanges with holes on 1.25" centers. 4" wire leads.



RMB12 .... $3.00

POWER RESISTOR

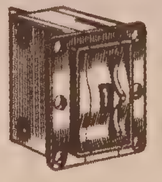
50-OHM 25 WATT



Very low inductance, 50-OHM wirewound power resistor makes this ideal for building a QRP dummy load.

PR5025 .... $.79

THUMBWHEEL SWITCHES



Decimal: 1 Pole
10 Position (0-9)
Black ABS Plastic
Body and Wheel.
Current price on these switches is about 10 times what we're selling these for.

EXCELLENT EXPERIMENT ITEM.

PART NO.	DIGITS	PRICE
TS1D	1	$1.25
TS2D	2	1.50
TS3D	3	1.75
TS4D	4	2.00
TS5D	5	2.25
TS6D	6	2.50

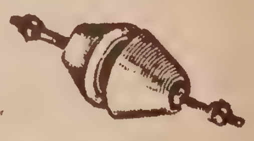
ELECTROLYTIC CAPACITOR

AXIAL LEAD

10µF 250V
Case size: 3/8"Dia. x 7/8"Long

ALC1025 .... $.40

FEED THRU BUSHING

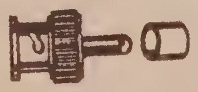


For Antenna lead-in, high voltage feed-thru, or other applications. Strong, well made steatite. Includes all hardware. Measures 2 5/16" L x 1 3/4" Dia.

FB2516 .... $8.95

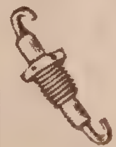
BNC CONNECTOR

- Crimp Type
- 2-Piece Construction
- Solderless
- For RG59



BN59 .... $.99

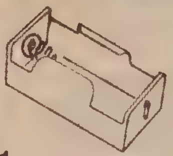
56PF FEED-THRU

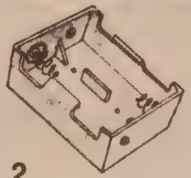


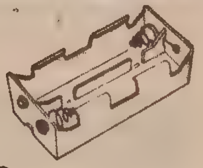
1 1/8" long hook terminals
1/4" mount hole
working volts 1KV

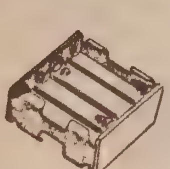
CF-56 .... $.50

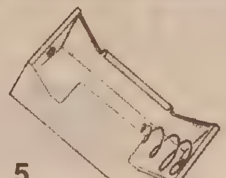
BATTERY HOLDERS & EXPERIMENTER PRODUCTS

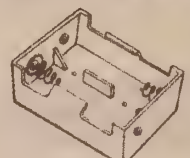

1

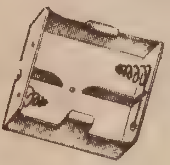

2

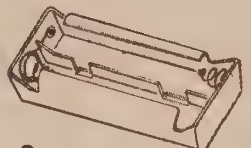

3

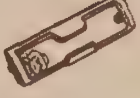

4

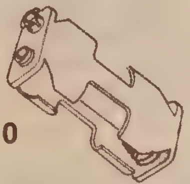

5

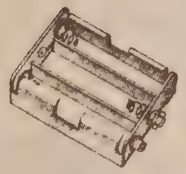

6

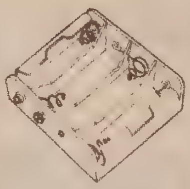

7

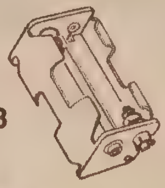

8

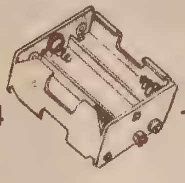

9

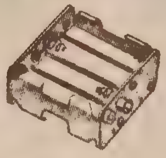

10

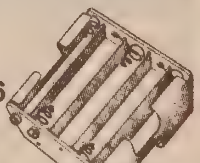

11

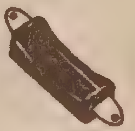

12

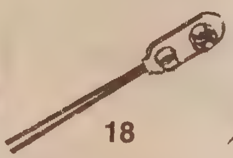

13

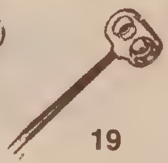

14

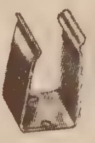

15

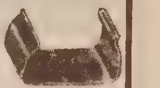

16


17


18


19


20


21

PART NO.	FIG.	HOLD CELLS	TERMINAL TYPE	PRICE
BH111	1	1D	SOLDER LUGS	1.00
BH121	2	2D	SOLDER LUGS	1.45
BH142	3	4D	SOLDER LUGS	1.80
BH181	4	8D	SOLDER LUGS	2.90
BH211	5	1C	SOLDER LUGS	1.00
BH221	6	2C	SOLDER LUGS	1.40
BH243	7	4C	SOLDER LUGS	1.80
BH261	8	6C	SOLDER LUGS	2.10
BH311	9	1AA	SOLDER LUGS	.75
BH321	10	2AA	SNAP TERMINAL	.75
BH331	11	3AA	SNAP TERMINAL	1.10
BH341	12	4AA	SNAP TERMINAL	1.20
BH343	13	4AA	SNAP TERMINAL	1.20
BH363	14	6AA	SNAP TERMINAL	1.40
BH383	15	8AA	SNAP TERMINAL	1.50
BH107	16	10AA	SNAP TERMINAL	3.55
BH011	17	1N	LUGS	.55
BH9V6	18	9V	6" LEADS	.29
BH9V10	19	9V	6" LEADS "T"	.29
BH9VH	20	9V	VERTICAL MOUNT	.49
BH9HH	21	9V	HORIZONTAL MOUNT	.39

10.7 MHz CERAMIC FILTER

Useful in all types of FM receivers, from commercial to public service 2 meter amateur etc . . . This Part is frequently called for in circuits using the NC3362 as well as other FM IF detector chips.

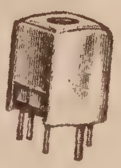
86-1448 .... $2.90

RELAY 12VDC SPDT

Sigma #65FP1A-12DC
1700 ohm coil
1 amp contacts
PC pins can be wrapped and soldered
1.25" x 1" x 1.25" high including pins.

RY65FP12 .... $1.95

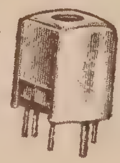
10.7 MHz IF TRANSFORMER



Commonly used for the second IF in receivers. Primary: 15K, Secondary: 300 ohms.

86-1444 .... $2.19

455 kHz IF TRANSFORMER



Use as a 1st IF transformer. Primary: 50K. Secondary 500 ohms.

86-1440 .... $2.19

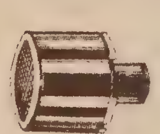
24 VOLT DC 4PDT RELAY

Omron LZNQ4-UA-00-7002

3K ohm coil
2 amp contacts
1-3/16" x 15/16" x 9/16" including pins

RY24V4P $1.80

ULTRASONIC TRANSDUCER



Transmits or receives 40k Hz ultrasonic waves. For remote controls, radios, TV's appliances; also for remote switching such as door openers, remote signaling and ultrsonic intrusion protecting devices and alarms. Diagrams of practical circuits included.

SQ-40T $4.99

ELECTRONIC XENON FLASH TUBE

- U-Shaped for high FPS timing and signal light
- Ideal for strobe light, photoflash, etc.
- Min Anode Voltage - 200V
- Max. Anode Voltage - 400V
- Use with No. 486 Trigger Coil

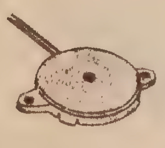
J485 .... $7.95

TRIGGER COIL

- 4KV
- Use with No. J485 Xenon Flash Tube

J486 .... $4.95

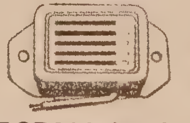
DC PIEZO SOUNDER



Sound output of 95dB minimum at a distance of 12 inches. Nominal frequency of 3k Hz. Low energy concumption (20mA at 12V DC) make it suitable for any number of alarm and signaling applications. Broad DC power range: 3-20VDC.

J4-817 .... $4.75

MINIATURE BUZZERS



Solid state electronic buzzer with 70dB sound. High reliability, long life buzzer. Low current drain, no moving contact. No arcing or RF noise. Automatic warning and monitoring indicators.

DCB814 (3 VOLTS) $3.38
DCB816 (6 OR 9 VOLTS) $3.38
DCB822 (9 VOLTS) $3.38
DCB812 (12 VOLTS) $3.38
DCB824 (24 VOLTS) $3.38

SILICON PHOTO TRANSISTORS

These devices are an electronic switch. When this unit is activated current is allowed to flow through the device. These items are used in Optical encoders, Automatic Control Systems, Photo Detectors and other applications where an optical switch is needed. Max-breakdown voltage 30V, typical voltage 5V, typical carrying current 20mA.

3 mm (T-1)

Part No.	Viewing Angle	Price
11-690	30°	$.99

5 mm (T-13/4)

Part No.	Viewing Angle	Price
11-691	35°	$.99

CONNECTOR ADAPTERS

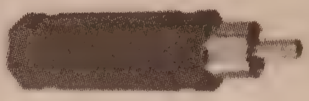
1/4" Stereo Phone Jack to
Mini 1/8" Mono Phone Plug

35-549A..................$0.90

1/4" Mono Phone Jack to
1/8" Mini Mono Phone Plug

35-540A..................$1.20

1/4" Mono Phone Jack to
RCA Phone Plug



35-530A..................$1.15

RCA Phone Plug
Both Ends

35-535A..................$1.55

1/8" Mono Jack to
Submini Mono Phone Plug

35-542A..................$0.95

1/4" Stereo Phone Plug to
3.5mm Mono Jack

35-538A..................$1.55

RCA Phone Jack
Both Ends

35-SA13..................$0.75

Phone Jack to
1/4" Mono Phone Jack

35-114....................$0.90

RCA Phone Jack to
1/8" Mono Phone Plug

35-533A..................$0.95

3.5mm Stereo to
Dual RCA Jacks

35-586....................$2.10

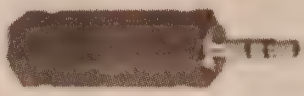
RCA Phone Plug to
1/8" Mono Phone Jack

35-531....................$1.55

1/4" Mono Phone Plug to
1/8" Mono Phone Jack

35-532....................$0.95

1/4" Stereo Phone Jack to
Mini Stereo 1/8" Phone Plug



35-558A..................$1.05

1/4" Stereo Phone Plug to
Mini Stereo 1/8" Phone Jack

35-559A..................$1.05

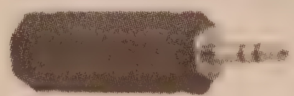
Mono 1/8" Phone Plug to
Stereo 1/8" Phone Jack

35-560....................$1.05

1/4" Stereo Plug to
1/4" Stereo Jacks

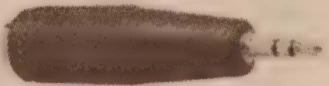
35-200....................$1.80

3.5mm Stereo Plug to
2.5mm Stereo Jack



35-630A..................$2.05

2.5mm Stereo Plug to
3.5mm Stereo Jack



35-640A..................$2.30

3.5mm Mono Plug to
2.5mm Mono Jack

35-544A..................$1.10

RCA Plug to
Dual RCA Jacks

35-504....................$1.75

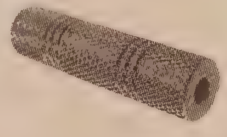
Dual RCA Jack to
Dual RCA Jack
Gold Plated

35-230......................$1.95

Triple RCA Jack to
Triple RCA Jack
Color Coded Red,
White, & Yellow Gold Plated

35-333.....................$2.95

1/8" (3.5mm) Stereo Jack to
1/8" (3.5mm) Stereo Jack
(Coupler)



35-182......................$1.80

1/4" Stereo Jack to
1/4" Stereo Jack

35-142.....................$2.40

Mono Mini 1/8" Phone Plug to
Mini-Stereo 1/8" Phone Jack
Right Angle

35-561A..................$2.70

Stereo Mini 1/8" Phone Plug to
Stereo Mini 1/8" Phone Jack
Right Angle

35-556A..................$2.30

1/4" Stereo Phone Plug to
Mini 1/8" Stereo Phone Jack
Right Angle

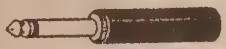
35-559....................$1.80

RCA Jack to
RCA Plug
Right angle

35-316B Black............$2.20
35-316R Red...............$2.20

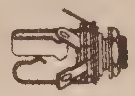
PLUGS & JACKS

1/4" PHONE PLUG
MONO: PLASTIC
2 CONDUCTOR



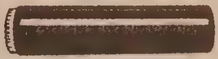
30-402 . BLACK ... .80
30-403 ... RED ..... .80

1/4" OPEN CIRCUIT
JACK. MONAURAL
2 CONDUCTOR



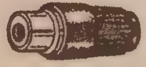
30-411 .... .75

1/4" INLINE JACK
2 CIRCUIT MONO
1/2"DIA x 1 11/16"L



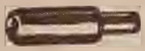
30-415B BLACK .80
30-415R . RED ... .80

RCA TYPE
PHONO JACK



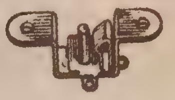
30-015 BLACK . .40
30-015R RED ... .40

3MM COAX
POWER PLUG FOR
VIDEO CAMERA
BATTERY PACKS



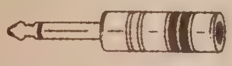
30-208 .... .65

COAX POWER JACK
MOUNTING CENTERS
11/16" WITH HARDWARE



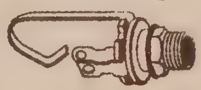
30-209 2.1MM DIA . .85
30-249 2.5MM DIA 1.00

1/4" PHONE PLUG
METAL CASE
2 CONDUCTOR



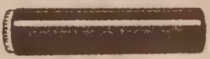
30-404 .... 1.00

1/4" CLOSED
CIRCUIT JACK.
2 CONDUCTOR
MONAURAL



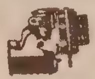
30-412 .... 1.00

1/4" 3 CIRCUIT
STEREO INLINE
JACK. BLACK ONLY



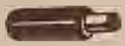
30-413 .... .70

3.5MM 2 CIRCUIT
MONO PHONE JACK
CHASSIS MOUNT.



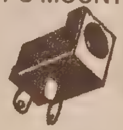
30-702J .... .55

1.3MM COAX POWER
PLUG WITH
RETENSION STEP.
USED ON MANY
HANDY TALKIES.



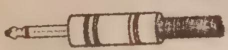
30-204 .... .75

COAX POWER JACK
2.1MM PIN
PC MOUNT



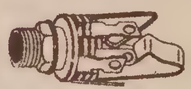
30-370 .... .60

1/4" PHONE PLUG
MONO: METAL CASE
INCLUDES STRAIN
RELIEF SPRING



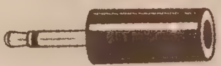
30-536 .... 1.20

1/4" 3 CIRCUIT
STEREO JACK.



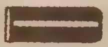
30-400 .... 1.00

3.5MM PHONE
PLUG. 2 CIRCUIT
MONO



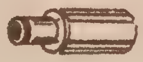
30-416B BLACK . .60
30-416R . RED ... .60

3.5MM INLINE JACK
2 CIRCUIT MONO.
5/16"DIA x 1"L



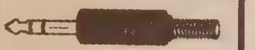
30-501V .... .50

COAXIAL POWER PLUGS



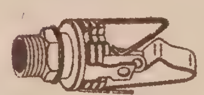
PART NO.	DIAM.	LENGTH	PRICE
30-210	.083(2.1MM)	1"	.65
30-250	.098(2.5MM)	1"	.65
30-210L	.083(2.1MM)	1 7/16"	.80
30-250L	.098(2.51MM)	1 7/16"	.65

1/4" 3 CIRCUIT
STEREO PLUG
PLASTIC CASE STRAIN
RELIEF SPRING



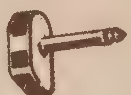
30-401S 1.00

1/4" 2 CLOSED
CIRCUIT STEREO
JACK.



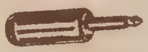
30-385 .... 1.80

3.5MM RIGHT
ANGLE MONO
PHONE PLUG



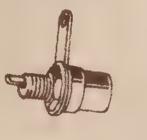
30-376 .... .70

2.5MM SUB-MINI
2 CONDUCTOR
PLUG



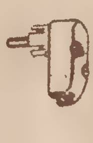
30-660P .... .90

RCA TYPE PHONO
JACK. SINGLE
HOLE MOUNT



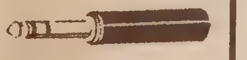
30-428 .... .60

RCA TYPE
90° PHONO PLUG



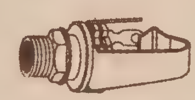
30-384 .... .70

1/4" 3 CIRCUIT
STEREO PLUG
PLASTIC CASE



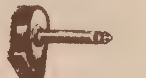
30-401 .... .75

1/4" 1 CLOSED
CIRCUIT STEREO
JACK.



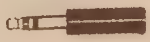
30-394 .... 1.60

3.5MM RIGHT
ANGLE STEREO
PHONE PLUG



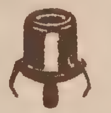
30-386 .... .80

2.5MM SUB-MINI
3 CONDUCTOR
PLUG



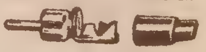
30-666P 1.40

RCA TYPE PHONO
JACK. PC MOUNT



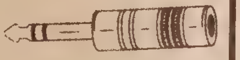
30-368 .... .40

RCA TYPE
PHONO PLUGS.
WITH CABLE CLAMP
PLASTIC BARREL
SCREWS TO PLUG.



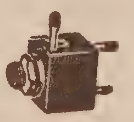
30-448 . BLACK ... .45
30-449 ... RED ..... .45

1/4" 3 CIRCUIT
STEREO PLUG.
METAL CASE



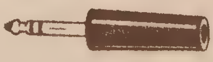
30-401M 1.10

1/4" OPEN CIRCUIT
2 CONDUCTOR
JACK.



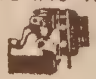
30-2280 .... 1.00

3.5MM 3 CIRCUIT
STEREO PHONE
PLUG



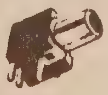
30-489 .... .60

2.5MM SINGLE
CLOSED CURCUIT
JACK.
MOUNTS IN 5/32" HOLE
UP TO 1/16" THICK.



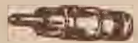
30-660J .... .50

RCA TYPE PHONO
JACK. RIGHT
ANGLE PC MOUNT



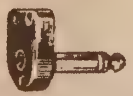
30-367 .... .70

RCA TYPE
SHIELDED PHONO
PLUG. NICKEL
PLATED



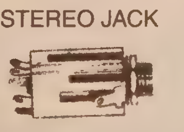
30-427 .... .70

1/4" RIGHT ANGLE
MONO PHONE
PLUG.
PLASTIC CASE.



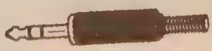
30-407 .... 1.00

1/4" CLOSED
CIRCUIT
3 CONDUCTOR
STEREO JACK



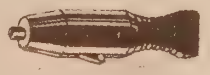
30-2288 .... 1.45

3.5MM 3 CIRCUIT
STEREO PHONE
PLUG. MOLDED
STRAIN RELIEF.



30-488 .... .60

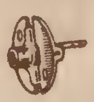
CIGARETTE LIGHTER
RECEPTACLE PLUG



Fits into cigarette lighter receptacle for a convenient source of 12 volts DC. Plated springloaded center contact and dual side wipers assure minimum voltage drop. Unscrews for ease in fastening wires. Made of high impact plastic.

TC644 .... $1.29

PHONO JACK
USED ON RECORDING
UNITS, PHONOGRAPHS
& RECEIVERS.

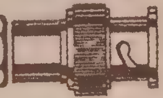


30-2021 .... .40

BNC CONNECTORS & ADAPTORS

STANDARD TYPE SOLDER

6 PIECE TYPE



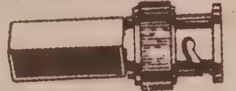
CABLE TYPE

27-9020	RG-59 & 62 (UG-260U)	1.60
27-9021	RG-58(UG-88U)	1.60

TWIST-ON 1 PIECE CONSTRUCTION

CRIMPLESS AND SOLDERLESS
-FIELD INSTALLABLE-

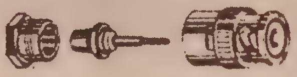
"Strip the Wire and Twist It On"



CABLE TYPE

27-9050	RG-59 & 62	1.90
27-9051	RG-58	1.90
27-9052	RG-6	2.20
27-9054	RG-58 & 62 TEFLON	2.60
27-9058	BELDEN 8281	2.60
27-9059	RG-58 TEFLON	2.60
27-9202	RG-58 AU	2.60
27-9206	RG-58 THIN NET	2.70

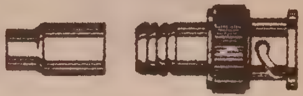
STANDARD TYPE 3 PIECE CRIMP OR SOLDER



CABLE TYPE

27-9022	RG-58	2.35
27-9023	RG-59 &62	2.35
27-9025	TEFLON 59 &62	2.75
27-9026	RG-8X MINI 8	2.35
27-9027	BELDEN 8281	2.75
27-9102	RG-6	2.35
27-9108	RG-8x MINI 8	1.75

CRIMP TYPE 2 PIECE CONSTRUCTION SOLDERLESS



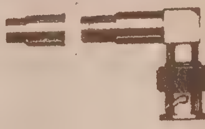
CABLE TYPE

27-9000	RG-59 & 62	1.40
27-9001	RG-58	1.40
27-9002	RG-6	1.80
27-9006	BELDEN 8281	1.90
27-9009	RG-59 & 62 TEFLON	1.80
27-9200	RG-58 AU	1.80
27-9204	RG-58 TEFLON	1.60
27-9207	RG-58 THIN NET	1.80
27-9209	RG-6 TEFLON	1.70
27-9210	RG-59 & 62 TEFLON (18-24 AWG)	1.70

CRIMP TYPE

RIGHT ANGLE

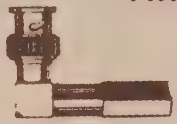
TWO PIECE CONSTRUCTION



CABLE TYPE

27-9004	RG-59 & 62	2.70

TWIST-ON RIGHT ANGLE

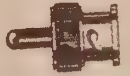


CABLE TYPE

27-9056	RG-59 & 62	2.95
27-9057	59-62 TEFLON	2.95
27-9036	RG-58	3.49
27-9037	BELDEN 8281	3.49
27-9038	RG-6	3.49

BNC TERMINATOR

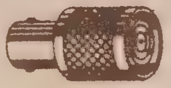
.5 W @ 1%



CABLE TYPE

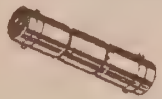
27-9007	75 OHM)	1.90
27-9008	50OHM	1.90
27-9093	93 OHM	1.90

BNC ADAPTORS & CHASSIS MOUNTS

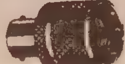


BNC to TNC
FEMALE MALE
27-8250 .... 2.69

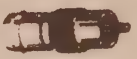
UG-914/U



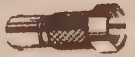
BNC INLINE SPLICE
25-7430 .... 2.69



BNC to UHF
FEMALE MALE
27-8120 .... 2.49

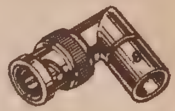


BNC to RCA
FEMALE MALE
27-8110 .... 1.95

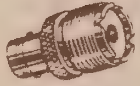


BNC to F
FEMALE MALE
27-8100 .... 1.95

UG-306/U

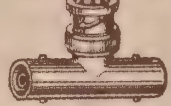


BNC RIGHT ANGLE
FEMALE to MALE
27-8150 .... 3.39

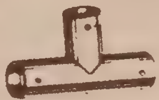


BNC to UHF
FEMALE FEMALE
25-7365 .... 2.05

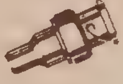
UG-274/U



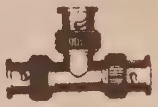
BNC "T"
2 FEMALE 1 MALE
27-8140 .... 2.79



BNC "T"
3 FEMALE
27-8141 .... 2.99

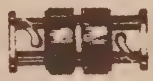


BNC to RCA
MALE FE MALE
25-7510 .... 1.59



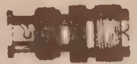
BNC "T"
3 MALE
27-8142 .... 4.70

UG-491/U



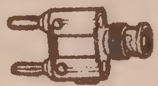
BNC to BNC
MALE MALE
27-8130 .... 2.98

UG-255



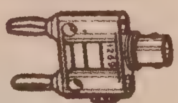
BNC to UHF
MALE FEMALE
25-7420 .... 3.10

BNC MALE TO DUAL BANANA PLUGS



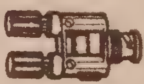
25-2380 .... 4.50

BNC FEMALE TO DUAL BANANA PLUGS



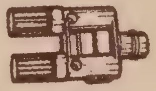
25-2382 .... 4.50

BNC MALE TO DUAL BINDING POSTS

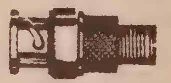


25-2390 .... 4.50

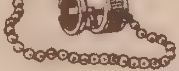
BNC FEMALE TO DUAL BINDING POSTS



25-2392 .... 4.50

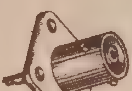


BNC TO F
MALE FE MALE
25-7500 .... 2.20



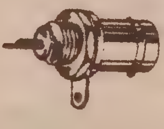
BNC MALE
DUST CAP
27-9211 .... 4.29

UG-290U

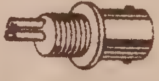


27-8450 .... 2.49

UG-1094/U

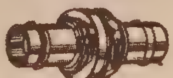


3/8" DIAMETER
27-8460 .... .99



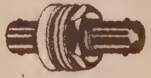
3/8" DIAMETER
ISOLATED CHASSIS MOUNT
27-8461 .... 2.69

UG-492



1/2" DIAMETER
DUAL CHASSIS MOUNT
27-8470 .... 3.75

UG-492
ISOLATED



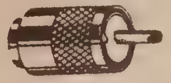
5/8" DIAMETER
DUAL CHASSIS MOUNT
27-8471 .... 3.95

QUANTITY DISCOUNTS AVAILABLE (50 OR MORE PCS.) PLEASE CALL OR WRITE

UHF & N CONNECTORS & ADAPTORS

PL-259

NICKEL PLATED



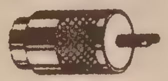
MADE IN USA

FOR RG-8, 11, 213, 214, 9913

25-7300 .... .99

PL-259

SILVER TEFLON

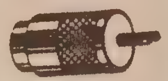


MADE IN USA

FOR RG-8, 11, 213, 214, 9913

25-7301 .... 1.49

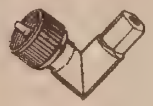
DELUXE PL-259 HI-TEMP INSULATION



FOR RG-8, 11, 213, 214

25-7305 .... 1.59

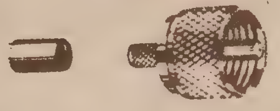
RIGHT ANGLE PL-259 SOLDERLESS



RG58/59

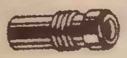
25-2140 .... $1.90

UHF CRIMP ON



25-7306 .... RG-8 .... 1.60
25-7307 .... RG-58 .... 1.20
25-7308 .... RG-59 .... 1.30

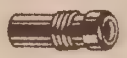
UG-175



USED WITH A PL-259
REDUCER FOR RG-58

25-7310 .... .35

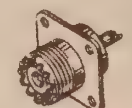
UG-176



USED WITH A PL-259
REDUCER FOR RG-59,
RG-8X

25-7320 .... .35

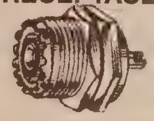
SO-239



CHASSIS MOUNT

25-7350 .... .99

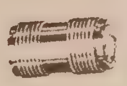
CHASSIS MOUNT RECEPTACLE



WITH NUT AND WASHER.
MOUNTS IN 21/32" HOLE

25-5630 .... 1.25

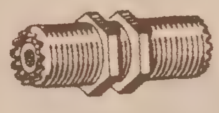
PL-258



INLINE SPLICE

25-7330 .... 1.30

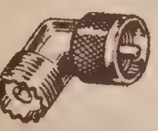
UG-363/U



DOUBLE UHF MALE

25-7351 .... 2.80

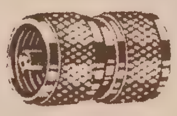
PL-359



RIGHT ANGLE

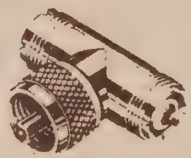
25-7340 .... 2.69

UHF/DM



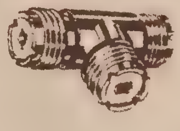
DOUBLE UHF MALE

25-7352 .... 2.80



"T" ADAPTOR
2 FEMALE 1 MALE

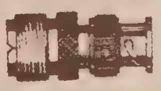
25-7353 .... 2.90



"T" ADAPTOR
3 FEMALE

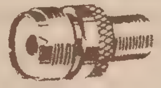
25-7354 .... 2.90

UG-255



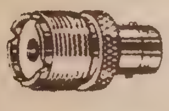
UHF to BNC
FEMALE MALE

25-7420 .... 2.50



UHF to F
FEMALE FEMALE

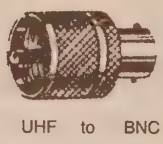
25-7361 .... 2.90



UHF to BNC
FEMALE FEMALE

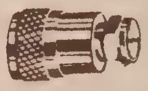
25-7365 .... 2.50

UG-273U



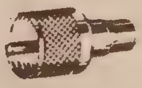
UHF to BNC
MALE FEMALE

27-8120 .... 2.49



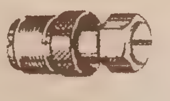
UHF to F
MALE MALE

25-7364 .... 2.10



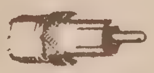
UHF to RCA
MALE FEMALE

25-7520 .... 1.49



UHF to F
FEMALE MALE

27-8200 .... 2.20

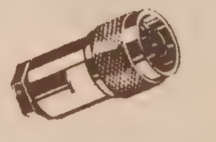


UHF to RCA
FEMALE MALE

27-8210 .... 1.60

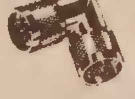
THE BEST "N" CONNECTOR ON THE MARKET!

High quality silver teflon with gold pin. 2 piece connector for easy installation. Back of connector is threaded to accept a UG-175 or UG-176 adapter making it a truly universal "N" connector. Accepts cables RG-58, 59, 8U, 8X and Belden 9913. Each connector factory tested before shipping. Made in USA.



26-8001 .... 3.49

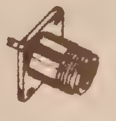
N RIGHT ANGLE
DOUBLE MALE



26-8022 .... 4.69

UG-58B/U

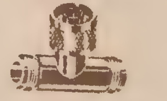
CHASSIS MOUNT
TYPE N



26-8011 .... 2.50

UG-107/U

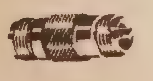
"T" ADAPTER
FEMALE TO MALE
TYPE N



26-8013 .... 5.90

UG-29B/U

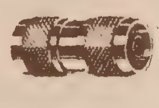
INLINE SPLICE
FEMALE TO FEMALE
TYPE N



25-8010 .... 3.79

UG-57B/U

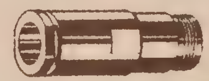
INLINE SPLICE
MALE TO MALE
TYPE N



26-8009 .... 4.90

UG-23B/U

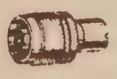
FEMALE CONNECTOR
FOR RG-8, 11, 213, 214
TYPE N



26-8002 .... 3.90

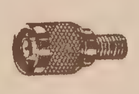
UG-146U

N to UHF
MALE FEMALE



26-8015 .... 3.90

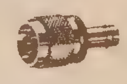
N to F
MALE FEMALE



26-8020 .... 3.90

UG-201/U

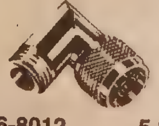
N to BNC
MALE FEMALE



26-8016 .... 3.90

UG-27U

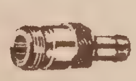
N RIGHT ANGLE
MALE TO FEMALE



26-8012 .... 5.20

UG-606U

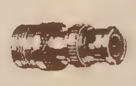
N to BNC
FEMALE FEMALE



26-8018 .... 3.40

UG-349U

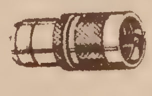
N to BNC
FEMALE MALE



26-8017 .... 3.90

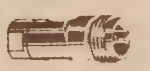
UG-83U

N to UHF
FEMALE MALE



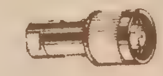
26-8014 .... 3.90

FEMALE N TERMINATOR
50 OHMS 1 WATT @ 2%



26-8024 .... 3.90

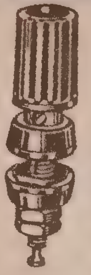
MALE N TERMINATOR
50 OHMS 1 WATT @ 2%



26-8023 .... 4.90

BINDING POSTS, JACKS & ADAPTERS

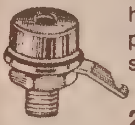
5 WAY BINDING POST



Plastic insulation. has 5/16" keyed threaded mounting shaft. will mount in panels up to 1/4" thick. Colors shown below.

90-799	Black	1.00
90-800	Red	1.00
90-801	Green	1.00
90-802	White	1.00
90-803	Yellow	1.00
90-804	Blue	1.00

CHASSIS MOUNT BANANA JACK



Accommodeated all standard banana type plugs. Mounts in a 5/16" diameter hole in panels up to 3/8" thick. Supplied with insulated shoulder washer, soldering lug and nut.

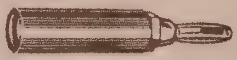
2350BK	**Black**	**.95**
2350RD	**Red**	**.95**

INSULATED SR. SOLDERLESS PHONE TIP PLUG

Fits all standard phone tip jacks. Insulated sleeve 3/4" long. Cable opening 3/16". Overall length 1 15/16".

2348BK	**Black**	**.89**
2348RD	**Red**	**.89**

INSULATED BANANA PLUG

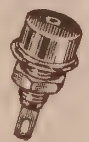


Molded bakelite handle. 1" long , and brass nickel-plated spring-type plug, with internal stud. Overall length 1 7/8". Wire can be soldered to brass stud or to plug. Stud locks wire to plug for solderless connection.

2349BK	Black	.89
2349RD	Red	.89
2349GN	Green	.89
2349WE	White	.89
2349YW	Yellow	.89
2349BE	Blue	.89

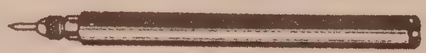
INSULATED PHONE TIP JACK

Mounts in 5/16" hole in panels up to 1/2" thick.



19-33BK	**Black**	**1.59**
19-33RD	**Red**	**1.59**

SOLDERLESS TEST PRODS 4 INCHES LONG

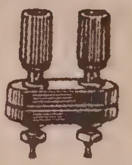


Made of non-breakable extruded plastic. Equipped with brass nickel plated solderless phone tips 3/4" long.

912J	**Black handle**	**.99**
913J	**Red handle**	**.99**

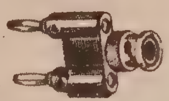
DUAL BINDING POST

.75" CENTER TO CENTER SPACING



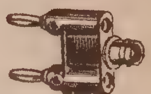
2370	**Two Black**	**2.70**
2372	**Two Red**	**2.70**
2374	**One Red, One Black**	**2.70**

BNC MALE TO DUAL BANANA PLUGS



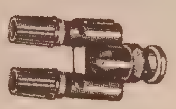
25-2380 .... 4.50

BNC FEMALE TO DUAL BANANA PLUGS



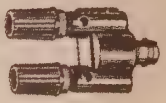
25-2382 .... 4.50

BNC MALE TO DUAL BINDING POSTS



25-2390 .... 4.50

BNC FEMALE TO DUAL BINDING POSTS

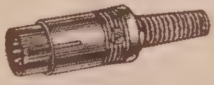


25-2392 .... 4.50

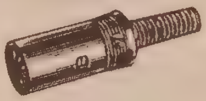
DIN, MULTIPIN MOBILE CONNECTORS

DIN CONNECTORS

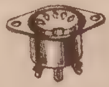
Originally a European Audio Connector design, these DIN Connectors have found acceptance in computer and other electronic connector applications. A combination of reliability and economy has prompted their widespread adoption.



IN-LINE MALE



IN-LINE FEMALE



CHASSIS MOUNT FEMALE

EL-

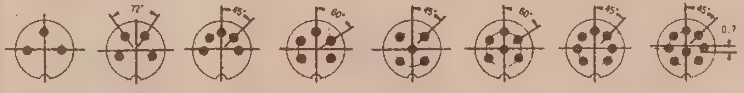
Ground springs are well-formed spring brass with minimal tendency to fatigue and longer firm retention. Superior fit of she¬¬ß makes assembly quicker and easier. A more rigid shell provides greater protection of terminal connections.

Heavier gauge metal & thicker plating on terminals and structure. Better solderability. Terminal numbers molded into insulator.

EA-

Shield clamp integral in structure. Superior finish on pins provide thousands of additional reliable connections. Plastic handle designed to cover the retention mechanism, leaving no exposed metal. Molded-in key facilitates assembly alignment.

Same construction as EL.

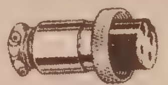


3 PIN **4 PIN** **5 PIN** **5 PIN** **5 PIN** **6 PIN** **7 PIN** **8 PIN**

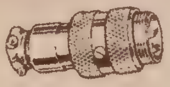
P/N	PINS	TYPE	PRICE	P/N	PINS	TYPE	PRICE
EA1	3	IN-LINE MALE	2.13	EL4	5(45)	IN-LINE FEMALE	3.39
EA5	4	IN-LINE MALE	2.99	EL9	6	IN-LINE FEMALE	3.69
EA2	5(45)	IN-LINE MALE	3.29	EL10	7	IN-LINE FEMALE	3.77
EA3	5(60)	IN-LINE MALE	3.39	EL11	8	IN-LINE FEMALE	3.89
EA4	5(45)	IN-LINE MALE	3.49	ES1	3	CHASSIS MOUNT	1.35
EA9	6	IN-LINE MALE	3.69	ES5	4	CHASSIS MOUNT	1.65
EA10	7	IN-LINE MALE	3.75	ES2	5(45)	CHASSIS MOUNT	1.74
EA11	8	IN-LINE MALE	3.89	ES3	5(60)	CHASSIS MOUNT	1.74
EL1	3	IN-LINE FEMALE	3.19	ES4	5(45)	CHASSIS MOUNT	1.74
EL5	4	IN-LINE FEMALE	3.39	ES9	6	CHASSIS MOUNT	1.78
EL2	5(45)	IN-LINE FEMALE	3.39	ES10	7	CHASSIS MOUNT	1.85
EI3	5(60)	IN-LINE FEMALE	3.39	ES11	8	CHASSIS MOUNT	1.93

MULTIPIN MOBILE CONNECTORS

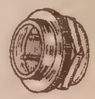
Although these connectors are generically identified as microphone connectors, they are used in a wide variety of applications which require reliable, economical multi-pin connections, particularly for rugged mobile use. The positive screw-on retaining ring, built-in strain relief, reliable contact design, and keyway mating combine to guarantee permanent contact under extremes of shock and vibration.



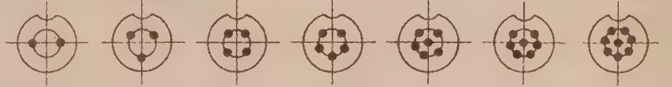
INLINE FEMALE



INLINE MALE



MALE CHASSIS SKT.

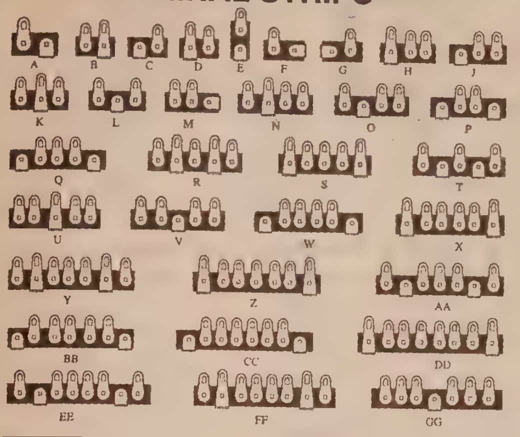


2 PIN **3 PIN** **4 PIN** **5 PIN** **6 PIN** **7 PIN** **8 PIN**

P/N	PINS	TYPE	PRICE
T602C	2	IN-LINE FEMALE	3.29
T607C	3	IN-LINE FEMALE	3.39
T609C	4	IN-LINE FEMALE	3.89
T612C	5	IN-LINE FEMALE	3.75
T616C	6	IN-LINE FEMALE	3.89
T707	7	IN-LINE FEMALE	4.95
T700	8	IN-LINE FEMALE	4.95
L602C	2	IN-LINE MALE	6.59
L607C	3	IN-LINE MALE	6.59
L606C	4	IN-LINE MALE	6.59
L505C	5	IN-LINE MALE	6.59
L616C	6	IN-LINE MALE	6.59
L707	7	IN-LINE MALE	6.59
L700	8	IN-LINE MALE	6.59
P602C	2	MALE CHASSIS SOCKET	2.49
P605C	3	MALE CHASSIS SOCKET	2.79
P606C	4	MALE CHASSIS SOCKET	2.89
P612C	5	MALE CHASSIS SOCKET	3.59
P616C	6	MALE CHASSIS SOCKET	3.79
P707	7	MALE CHASSIS SOCKET	4.29
P700	8	MALE CHASSIS SOCKET	4.29

TERMINAL STRIPS, BLOCKS, & BLADE TYPE CONNECTORS (JONES)

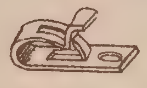
LUG TERMINAL STRIPS



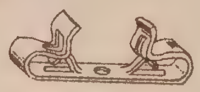
LUG MAT'L:
Steel, electro-tin plated.
LUG SPACING:
3/8"
STRIP MAT'L:
Flame Retardant Phenolic.
STRIP DIM:
3/8" Wide x .062" thick
MNTG. HOLE:
.140" I.D.
MNTG. SCREW:
#6

PART NO.	FIG NO.	PRICE EACH	PART NO.	FIG NO.	PRICE EACH
861	A	.28	868	R	.82
862	B	.34	847	S	.62
813	C	.40	865	T	.90
820	D	.30	866	U	.65
849	E	.41	855	V	.70
828	F	.54	869	W	.96
821	G	.54	854	X	1.20
830	H	.30	879	Y	.92
829	J	.58	859	Z	.65
864	K	.36	871	AA	.99
863	L	.45	860	BB	.85
846	M	.45	848	CC	.84
850	N	.48	900	DD	.84
857	O	.54	858	EE	1.20
867	P	.80	870	FF	1.05
853	Q	.54	901	GG	.90

FAHNESTOCK CLIPS



SINGLE TYPE
#2090



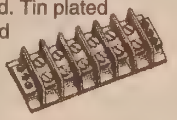
DOUBLE TYPE
#FC536

One of the oldest and most popular terminals ever made. Ideal for experimental bread-board assemblies where connecitons are to be changed readily. Made of brass with nickel-plated finish. #2090 Sold in packs of 10. FC536 Sold Each.

2090 5/16" W x 3/4" L .... **$1.20/10 Pack**
FC536 3/8" W x 2 1/8" L .... **$1.25 Each**

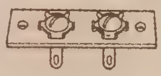
DOUBLE ROW TERMINAL BLOCKS

Used for general purpose electronic and electrical work. Terminal blocks are used extensively to help eliminate splicing. Order by number of positions needed. Tin plated brass terminals and cadmium plated steel screws. 20A, 1600V.



PART NO.	POS.	L(IN)	W(IN)	PRICE
TB47302	2	1.31	1.12	.96
TB47303	3	1.75	1.12	1.32
TB47304	4	2.14	1.12	1.68
TB47305	5	2.62	1.12	2.08
TB47306	6	3.06	1.12	2.48
TB47308	8	3.94	1.12	3.32
TB473012	12	6.00	1.12	4.76

BAKELITE TERMINAL BOARD



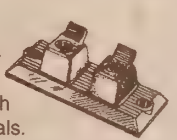
Screw Type

Terminals made of brass hot tinned, mounted on X.P. Bakelite 5/8" wide x 1/16" thick, spaced 7/16" centers. Screws are 6-32 x 3/8" cadmium plated.

PART NO.	TERMI-NALS	MTG. CENTER	PRICE EACH
15-72	2	1 7/16"	.57
15-73	3	1 3/4"	.85
15-74	4	2 3/16"	.95
15-75	5	2 5/8"	1.30
15-76	6	3 1/16"	1.55
15-77	7	3 1/2"	1.70
15-81	SHORTING LINK		.11

TERMINALS

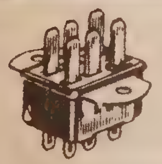
Push terminals, color-coded. Push action release holds wire with spring-tension terminals.



90-750 2-Connector (1 red, 1 black) .... .90
90-751 4-Connector (2 red, 2 black) 1.55

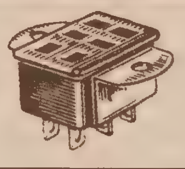
PLUG AND SOCKET BLADE TYPE CONNECTORS

- Thermoplastic Backshells
- Electrical Ratings Per Contact
- 10 Amps, 750V RMS

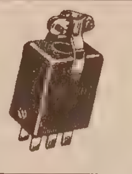


PANEL MOUNT

- Side Angle Brackets

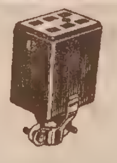


PLUG PART NO.	NO. CKTS	PRICE	SOCKET PART NO.	PRICE
PA-2	2	1.80	SA-2	1.90
PA-3	3	1.90	SA-3	1.95
PA-4	4	2.15	SA-4	2.20
PA-6	6	2.40	SA-6	2.70
PA-8	8	2.80	SA-8	3.25
PA-10	10	3.25	SA-10	3.80
PA-12	12	3.70	SA-12	5.90



CABLE MOUNT

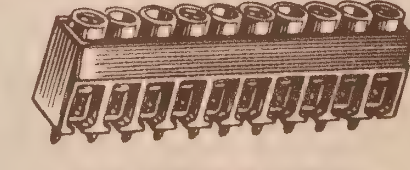
- Top Cable Clamp

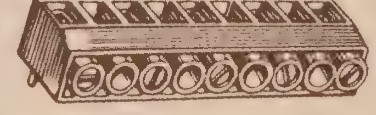


PLUG PART NO.	NO. CKTS	PRICE	SOCKET PART NO.	PRICE
PC-2	2	2.75	SC-2	3.00
PC-3	3	2.95	SC-3	3.15
PC-4	4	3.15	SC-4	3.30
PC-6	6	3.45	SC-6	3.80
PC-8	8	3.80	SC-8	4.20
PC-10	10	4.15	SC-10	4.80
PC-12	12	4.50	SC-12	5.45

EURO STYLE PC MOUNT TERMINAL BLOCK

- **Single Piece Fixed Blocks**
- **For Permanent Mounting to PC Boards**
- **Accepts 12 to 30 AWG Wire**
- **.042 Diameter Solder Pins**
- **Black Insulator**
- **.200" Spacing**
- **Rising Cage Pressure Clamp**
- 10 Amp Rating @ 250V 12AWG
- Withstands Volts (DMV) 6500VDC
- Insulator: Polyamide UL94V-0 Black

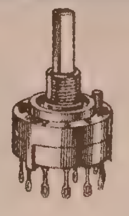




PART NO. STRAIGHT	NO. CKTS.	LENGTH (IN.)	PRICE	PART NO. 90°	PRICE
B88-2	2	.395	.95	B88-2R	1.05
B88-3	3	.595	1.45	B88-3R	1.55
B88-4	4	.795	1.90	B88-4R	2.10
B88-5	5	.995	2.25	B88-5R	2.60
B88-6	6	1.195	2.80	B88-6R	3.05
B88-8	8	1.595	3.75	B88-8R	3.95
B88-10	10	1.995	4.25	B88-10R	4.50
B88-12	12	1.395	5.50	B88-12R	5.75

SWITCHES

Open Style

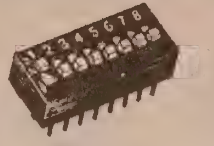

Enclosed Style

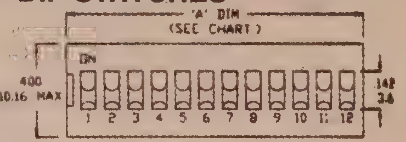
ROTARY SWITCHES

Non shorting contacts
.3AMP 125VAC
Solder Terminal
1/4" shaft

PART NUMBER	NO POLES	NO POSITIONS	STYLE	PRICE EACH
30-15205	2	5	OPEN	1.90
30-15303	3	3	OPEN	1.90
30-15100	1	12	ENCLOSED	2.40
30-15106	1	6	ENCLOSED	2.40
30-15203	2	3	ENCLOSED	2.40
30-15304	3	4	ENCLOSED	2.40
30-15403	4	3	ENCLOSED	2.40

DIP SWITCHES

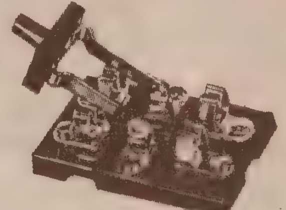




- SLIDE TYPE
- SPST
- CONTACTS RATED 50VDC, 100 MA AT STEADY SITUATION
- .10" PIN SPACING

PART NO.	NO. POS.	'A' DIM INCHES	'B' DIM INCHES	PRICE
DS1002	2	.260	.100	1.25
DS1003	3	.360	.200	1.35
DS1004	4	.460	.300	1.45
DS1005	5	.560	.400	1.55
DS1006	6	.660	.500	1.65
DS1007	7	.760	.600	1.80
DS1008	8	.860	.700	1.90
DS1009	9	.960	.800	2.10
DS10010	10	1.060	.900	2.15
DS10012	12	1.260	1.100	2.55

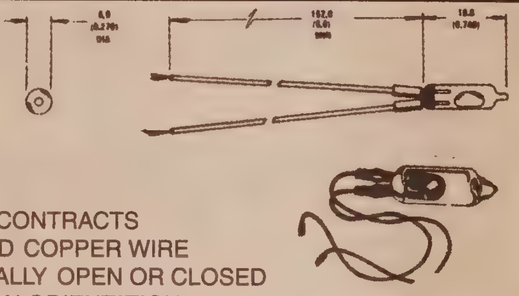
KNIFE SWITCH DPDT



- 3A, 200V AC/DC CONTRACTS
- SCREW TERMINALS
- DPDT ON-OFF-ON

35-730 .... **$2.90**

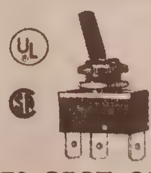
MERCURY TILT SWITCH – SPST



- 31A, 250 VAC CONTRACTS
- #26 INSULATED COPPER WIRE
- SPST - NORMALLY OPEN OR CLOSED DEPENDING ON ORIENTATION

35-760 .... **$2.49**

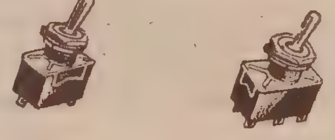
STANDARD SIZE PADDLE HANDLE



20A 250 VAC.
.5" mounting hole
Spade Terminals
Body Measures
1/2" x 1/2" x 1"

30-170 SPST ON-OFF **3.49**
30-172 SPDT ON-OFF-ON **3.69**

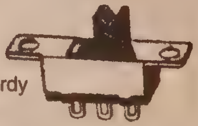
HEAVY DUTY 20 AMP (125V) SWITCHES



Mounts in 1/2" hole.
Bushing size: 15/32 dia. x 3/8" long.
Body size: 1 1/8" x 5/8" x 1" deep

40-560 SPST (On-Off) **$3.60**
40-561 SPDT (On-Off-On) **$3.60**
Center Off
40-562 DPST (On-Off) **$4.75**
40-563 DPDT (On-Off-On) **$4.75**
Center Off

SUB-MINIATURE SLIDE SWITCHES

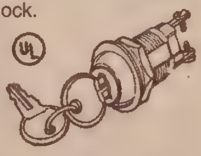


Extremely small in size, yet sturdy construction allows use where space is tight.
Size: 19/32" mounting centers (both).

40-617 SPDT - 3/4" x 7/32" x 3/8" ..... **.55**
40-618 DPDT - 3/4" x 5/16" x 37/8" ... **.60**

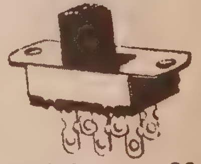
SPST KEY SWITCH

1Sometimes called shunt lock.
Complete with 2 keys and mounting hardware.
Used with most alarm equipment.



40-663 .... **$4.90**

STANDARD SLIDE SWITCHES



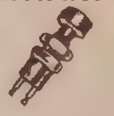
Rated 0.25 Amp, 125 volt.

40-622 SPDT Mtg. Centers 11/16" .... **.80**
40-623 DPDT Mtg. Centers 3/4" .... **.95**

PUSHBUTTON SWITCHES

SPST MOMENTARY

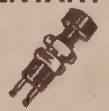
Normally open
3A 125VAC
Solder leads
Sub Mini



SW3125NO .... **.59**

SPST MOMENTARY

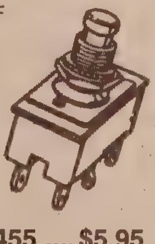
Normally closed
3A 125VAC
Solder leads
Sub Mini



SW3125NC .... **.59**

HEAVY DUTY PUSHBUTTON

15A 125VAC
SPST
ON-OFF



30-14455 .... **$5.95**

CIRCUITRY: SPST
CONTACT RATING: 3A 125VAC
Solder Terminals

PART NO.	FIG.	SWITCHING POSITION	PRICE
10060	1	OFF-ON	1.45
10062	1	OFF-(ON)	1.45
10064	2	OFF-ON	1.45
10066	2	OFF-(ON)	1.45

( )=Momentary

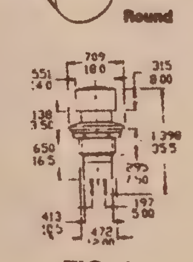


FIG. 1

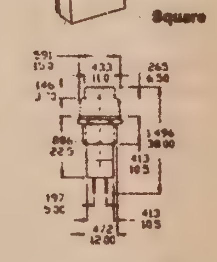


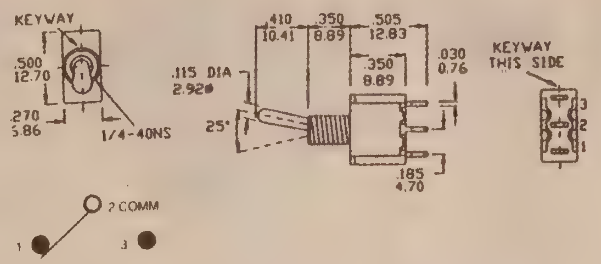
FIG. 2

TOGGLE SWITCHES

MINIATURE TYPE
- IDEAL SIZE FOR MOST PROJECTS
- 5A 120V CONTACTS
- SOLDER TERMINALS

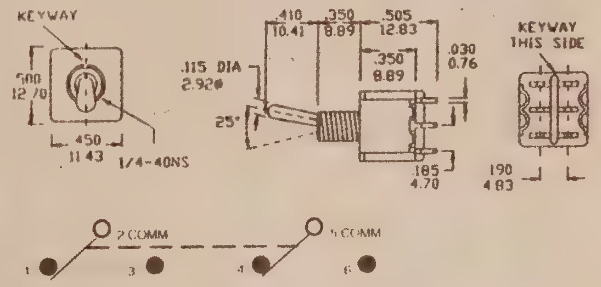
SPDT

PART NUMBER	SWITCHING POSITION			1-9	10-99
10002	ON	NONE	ON	1.50	1.35
10004	ON	NONE	(ON)	1.60	1.45
10006	ON	OFF	ON	1.80	1.65
10008	(ON)	OFF	(ON)	2.05	1.90
10010	ON	OFF	(ON)	2.20	2.05
TERM. COMM.	2-3	OPEN	2-1		


KEYWAY
.500
12.70
.270
6.86
1/4-40NS
.115 DIA
2.92ø
.410
10.41
.350
8.89
.505
12.83
.350
8.89
.030
0.76
25°
.185
4.70
KEYWAY THIS SIDE
1
2
3
2 COMM

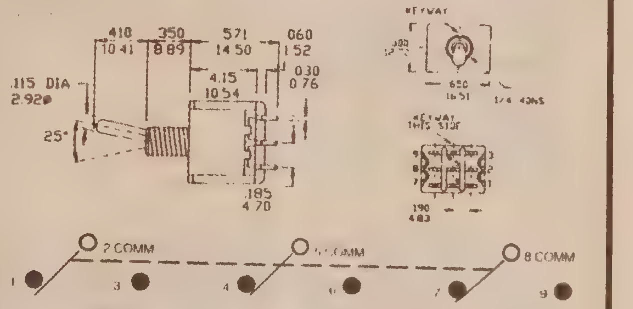
DPDT

PART NUMBER	SWITCHING POSITION			1-9	10-99
10012	ON	NONE	ON	2.30	2.15
10014	ON	NONE	(ON)	2.40	2.25
10016	ON	OFF	ON	2.40	2.25
10018	(ON)	OFF	(ON)	2.60	2.45
10020	ON	OFF	(ON)	2.60	2.45
TERM. COMM.	2-3 5-6	OPEN	2-1 5-4		


KEYWAY
.500
12.70
.450
11.43
1/4-40NS
.115 DIA
2.92ø
.410
10.41
.350
8.89
.505
12.83
.350
8.89
.030
0.76
25°
.185
4.70
KEYWAY THIS SIDE
.190
4.83
1
2 COMM
3
4
5 COMM
6

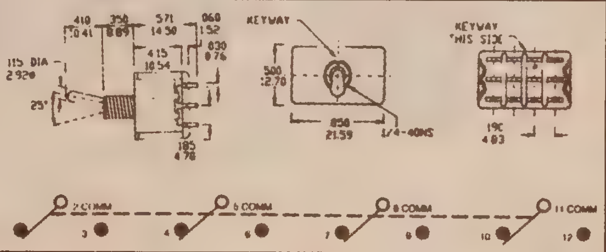
3PDT

PART NUMBER	SWITCHING POSITION			1-9	10-99
10022	ON	NONE	ON	3.75	3.60
10024	ON	OFF	ON	4.10	3.95
10026	(ON)	OFF	(ON)	4.35	4.20
10028	ON	OFF	(ON)	4.35	4.20
TERM. COMM.	2-3 5-6 8-9	OPEN	2-1 5-4 8-7		


.410
10.41
.350
8.89
.571
14.50
.060
1.52
.115 DIA
2.92ø
4.15
10.54
.030
0.76
25°
.185
4.70
KEYWAY
.650
16.51
1/4-40NS
KEYWAY THIS SIDE
.190
4.83
1
2 COMM
3
4
5 COMM
6
7
8 COMM
9

4PDT

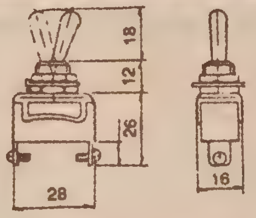
PART NUMBER	SWITCHING POSITION			1-9	10-99
10032	ON	OFF	ON	5.75	5.60
TERM. COMM.	2-3 5-6 8-9 11-12	OPEN	2-1 5-4 8-7 11-10		


.410
10.41
.350
8.89
.571
14.50
.060
1.52
.115 DIA
2.92ø
415
10.54
.030
0.76
25°
.185
4.70
KEYWAY
.500
12.70
.850
21.59
1/4-40NS
KEYWAY THIS SIDE
.190
4.83
2 COMM
3
4
5 COMM
6
7
8 COMM
9
10
11 COMM
12

NOTE: PARENTHESIS ( ) INDICATEDS MOMENTARY SWITCHING POSITION

MEDIUM DUTY TOGGLE SWITCHES - 10 AMP 120V CONTACT RATING

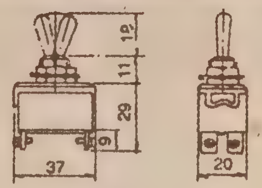
SCREW TERMINAL


18
12
26
28
16

DIMENSIONS (MM)

PART NO.	TYPE	TOGGLE ACTION	PRICE
T104	SPST	ON-OFF	2.75
T114	SPDT	ON-NONE-ON	2.95
T120	SPDT	ON-OFF-ON	2.95
T134	DPST	ON-OFF	3.10
T144	DPDT	ON-NONE-ON	3.10
T154	DPDT	ON-OFF-ON	3.10

SOLDER TERMINAL

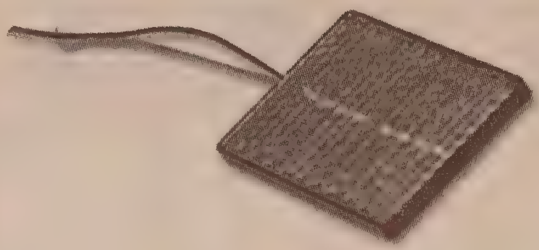

19
11
29
6
37
20

DIMENSIONS (MM)

PART NO.	TYPE	TOGGLE ACTION	PRICE
T100	SPST	ON-OFF	2.75
T110	SPDT	ON-NONE-ON	2.95
T120	SPDT	ON-OFF-ON	2.95
T130	SPDT	ON-OFF-ON	3.10
T140	DPDT	ON-NONE-ON	3.10
T150	DPDT	ON-OFF-ON	3.10

SOLAR CELLS

Encapsulated High Output Solar Cells



Our encapsulated "Mini-Panels" utilize solar cells similar to those that power satellites in space. They are safe and simple to use. Mini-Panels allow for handling without the normal breakage and cell damage associated with solar cells. They eliminate 99% of cell breakage and damage from handling, and collect light from all angles with their unique lens pattern. Can be used to power lamps, motors, and other low current drain devices.

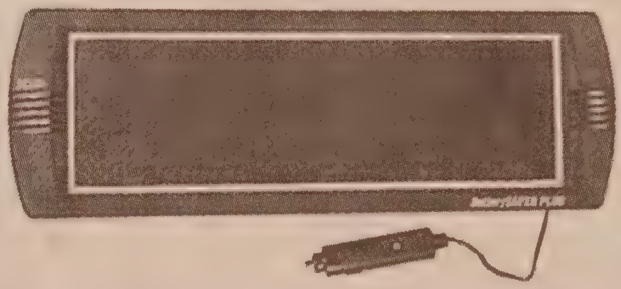
Part No.	Voltage	Current	Dimensions	Price
SOL-1	.50V	400mA	1.8" x 2.8" x 0.2"	$4.99
SOL-2	.50V	800mA	2.6" x 3.7" x 0.2"	$7.99
SOL-3	1.0V	200mA	1.8" x 3.0" x 0.2"	$4.99
SOL-4	2.0V	200mA	3.0" x 3.7" x 0.2"	$7.99

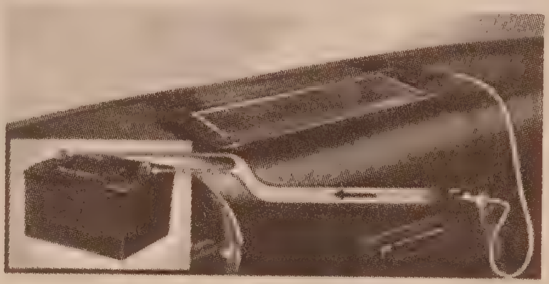
Portable Solar Power Source

Super-convenient portable recharging unit that converts sunlight into electricity wherever you need it. Particularly useful when you're trekking far from normal power sources. Delivers 1.8 watts of power at 12VDC. Will operate or charge cell phones, laptop computers, GPS units, FRS radios, PDAs, portable MP3/Disc Players, handheld gaming devices, and other small electronic devices. This is a great unit for powering QRP rigs.

Specifications

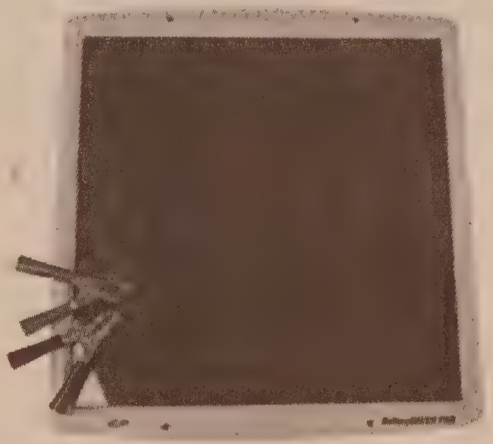
- Voltage : 12V
- Current : 125mA
- Connections : cigarette lighter plug with 10ft cable
- Dimensions : 12.0" x 3.9" x 1.0"





SOL-5...**$47.95**

High Power Solar Cell 12VDC at 350mA delivers 5-Watts of Power



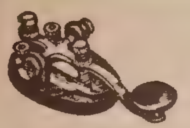
Specifications

- Voltage : 12V
- Current : 350mA
- Connections : battery clamps with 10ft cable
- Dimensions : 13" x 13" x 1"

Ideal for maintaining the battery voltage of your car, boat, RV, etc. This unit will handle ALL of your QRP needs, since QRP is defined as 5-Watts and less.

SOL-6...**$99.95**

COMMUNICATION ACCESSORIES



DELUX CODE KEY

Adjustable, heavy duty brass base with ball bearing pivots. Designed for hard usage. 3/16" plated contacts.

70-378 .... $16.95

CODE PRACTICE OSCILLATOR & MONITOR

IN KIT FORM OR WIRED

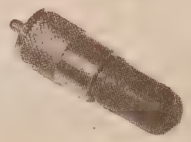
CODE PRACTICE OSCILLATOR
AMECO

Model OCM-2 is a solid-state code practice oscillator and monitor that uses the latest IC circuitry. It contains a 3" built-in speaker, headphone terminals, a volume control and a tone control. It is attractively packaged with a two color panel packaged with a two color panel. With the addition of a few parts, the unit can easily be converted inot a CW monitor. It can therefore be used as an operating aid after the code has been learned.

OCM-2K (Kit) $19.95
OCM-2W (Wired) $24.95

CB/HAM DUMMY LOAD

(5 WATT)

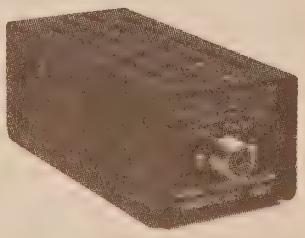


Perfect way to service and adjust transmitter without causing interference. Easy to use. Just unscrew existing antenna and replace with dummy load. Provides near perfect antenna match. Great for QRP.

75-476 ....$1.50

HIGH PERFORMANCE BROADBAND RF DUMMY LOAD

Covers the range from DC to 650MHz. Model DL-1500 is an aircooled unit that will handle an average of 1500 watts for up to 15 seconds & 150 watts continuously from DC to 650 MHz. The SWR is 1.1:1 for 160 meters to 2 meters. For 70 cm the SWR is less than1.5:1. Unit comes in strong, light-weight aluminum case perforated to enhance cooling.



DL-1500 .... $59.95

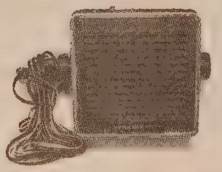
PREAMPLIFIER FOR TRANSCEIVERS

- Improves sensitivity while receiving
- No modification required to transceiver
- For single sideband, AM or CW use
- Can handle transceiver output up to to 350W.
- Can be used with separate linear amplifiers
- For transceiver or receiver use
- Adjustable delay control on front panel
- Optional second receiver capability
- Optional separate receiving antenna capability

PT-3 Wired & Tested **$119.95**
P-12T Adapter 120VAC - 12VDC **$9.95**

A continuously tunable 6-160 meter preamplifier, specifically designed for use with a transceiver. It features a dual-gate FET transistor amplifier which provides a low noise figure, thus improving the sensitivity of the receiver section of the transceiver. Signals are increased as much as 26dB. A unique built-in RF sensing circuit enables the PT-3 to bypass itself when the transceiver is transmitting. The gain of the preamplifier can be varied by the front panel RF gain control. This control can also be used to reduce the amplification prior to the first mixer, thereby minimizing or eliminating overload effects caused by strong off-channel signals. The PT-3 has an adjustable delay control on the front panel that determines the amount of time the PT-3 will stay in the transmit mode before returning to the receive mode after the operator stops talking. Provisions are included so that the PT-3 can easily be modified to feed the input of a second receiver. The PT-3 can also be modified by the user so that a separate receiving antenna can be used in addition to the The input and output impedances of the PT-3 are nominally 50 ohms. This matches most types of antennas. 12 volts DC is required to power the PT-3. If 120 volts AC is available, the Adapter, Model P-12T, can be used. It plugs into the 120 volt AC source and delivers an output of 12 volts DC for the standard PT-3.

COMMUNICATION SPEAKER



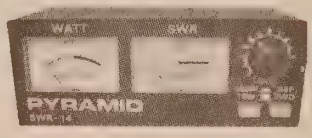
Designed for general communications. CB and Ham use. Excellent extension speaker for truckers, general mobile and base station. Features a noise cancelling switch for clearer reception. Made of high-impact plastic for durability. Comes complete with adjustable mounting bracket for desired positioning. The cord is 10 feet long, with a molded 3.5mm plug on the end.

SPECIFICATIONS:

Impedance	8 ohms
Size	4 5/16" X 4 5/16" X 2 9/16"
Power	5 watts (12 watt peak)

CB-2000...........................$9.95

SWR/WATT METER DUAL METERS



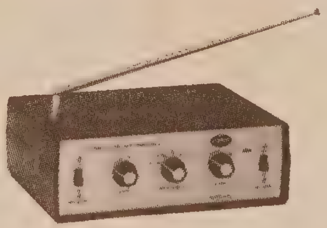
High quality compact devices for the amateur radio operator. Measures SWR, RF Power and field strength. Dual meters allow simutaneous readings of both RF Power and SWR. 2 Power ranges selects either 10 watts or 100 watts. The 10 watt scale is ideal for QRP operation.

SPECIFICATIONS:

Frequency Range	1.5 - 150 MHz
SWR:	1:1 to 1:3
Impedance	50 ohms
Dimensions	5 3/8" W x 2 1/8" H x 2 5/8" D
Connectors:	S0-239

SWR-14.......................$17.95

TUNABLE PREAMPLIFIER ANTENNA



- **Can be used as tunable preamplifier and/or indoor active antenna**
- **Complete coverage from 0.22 to 30 MHz**
- **Improves receiver gain and noise figure**
- **Over 20 dB gain on all frequencies**

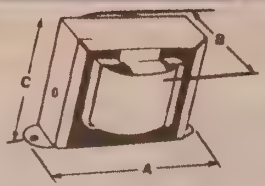
Model TPA can be used as a preamplifier to improve the gain of a receiver, or as an indoor active antenna. It contains a tuned RF amplifier that covers all frequencies from 0.22 to 30 MHz, including amateur bands, all foreign broadcast bands, citizens band and all other services in this range. A dual-gate field effect transistor provides an excellent noise figure and over 20 dB gain.

As a preamplifier, the input matches most antennas. Long wire, 300 ohm and random length antennas can be used with good results. When no external antenna is available, the preamplifier's whip antenna gives excellent results.

Model TPA uses either an internal 9 volt battery or an AC adapter, such as Model P-9T.

TPA Tunable Preamplifier Antenna. Wired & Tested $69.95
P-9T AC Adapter 9 V.DC Output. Wired & Tested $9.95

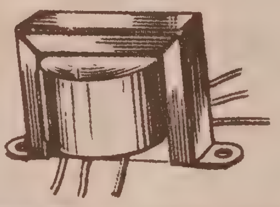
POWER TRANSFORMERS & LAMPS



CHASSIS MOUNT POWER TRANSFORMERS

For new applications or replacement in power supplies, test equipment, pre-amps, stereos, hobby projects, etc.
All secondary amps conservatively rated.
All primaries 115VAC @ 60 Hz.
Part numbers with * are dual voltage.

PART NO.	SECONDARY VOLTS	AMPS	SIZE(IN) AxBxC	TERMINATION	PRICE
TR631	6.3VCT	1A	2.81 x 1.5 x 1.69	LEADS	15.95
TR632	6.3VCT	2A	2.81 x 1.63 x 1.69	LEADS	15.95
TR326*	6V/32V	.25A/.50A	1 7/8 x 1 3/4 x 1 1/2	LEADS	4.75
TR106*	6V/10V	.20A/.20A	1 1/2 x 1 1/2 x 1 1/4	LEADS	4.75
TR3263*	6.3V/32V	.15A/.15A	1 5/8 x 1 1/2 x 1 3/8	LEADS	4.95
TR246*	6V/24V	.23A/.275A	1 5/8 x 1 1/4 x 1 3/8	LEADS	4.95
TR5010*	10V/50VCT	.20A/.25A	1 7/8 x 1 3/4 x 1 5/8	LEADS	4.95
TR12500	12VCT	.50A	2 5/16 x 1 5/16 x 1 5/8	LUGS	7.95
TR1261	12.6VCT	1A	2 3/16 x 2 1/8 x 1 7/8	LEADS	7.95
TR122	12VCT	2A	3 7/16 x 1 7/8 x 1 15/16	LUGS	10.95
TR125	12VCT	5A	3 3/4 x 2 1/2 x 2 1/2	LUGS	16.95
TR163	16VCT	3A	2 1/2 x 2 x 2 1/4	LEADS	18.95
TR181	18VCT	1A	2 1/4 x 1 1/2 x 1 7/8	LEADS	11.95
TR24500	24VCT	.50A	3 3/8 x 1 5/16 x 1 3/4	LUGS	5.95
TR241	24VCT	1A	2 5/16 x 2 1/8 x 2 5/16	LEADS	7.95
TR361	36VCT	1A	2 1/2 x 1 5/8 x 2 1/4	LEADS	18.95
TR248	48VCT	2A	4 x 2 3/4 x 2	LUGS	26.95



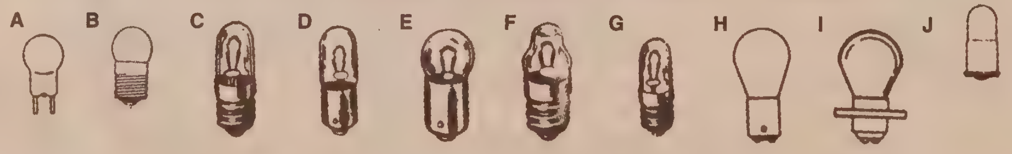
HIGH VOLTAGE TRANSFORMER FOR ANTIQUE RADIOS

The perfect transformer for tube type radio receivers or transmitters. Excellent for new construction or replacement. Not surplus New manufacture. Primary 120VAC, Secondary 480VAC at 50MA, 6.3V at 2A: 2 3/4"W x 2-1/4"H x 2"D. Priced Affordable enough to build that old radio!

TR480 .... **$24.95**

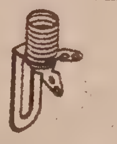
MINIATURE LAMPS & PANEL INDICATOR LAMPS

POPULAR MINIATURE REPLACEMENT LAMPS



P/N	NO.	VOLTS	BASE	FIG.	PRICE
L-12	12	6.3	MIN. 2-PIN	A	1.50
L-13	13	3.7	MIN. SCREW	B	.49
L-14	14	2.47	MIN. SCREW	B	.59
L-40	40	6.3	MIN. SCREW	C	.59
L-41	41	2.5	MIN. SCREW.	C	.59
L-43	43	2.5	BAYONET	D	.69
L-44	44	6.3	MIN. BAYONET	D	.49
L-45	45	2.5	BAYONET	D	1.25
L-46	46	6.3	SCREW	C	.59
L-47	47	6.3	BAYONET	D	.59
L-48	48	2.0	SCREW	C	.89
L-49	49	2.0	MIN. BAYONET	D	.99
L-50	50	7.5	SCREW	C	.89
L-51	51	7.5	MIN. BAYONET	E	.70
L-53	53	14.4	MIN. BAYONET	E	.65
L-55	55	7.0	MIN. BAYONET	E	.65
L-57	57	14.0	MIN. BAYONET	E	.55
L-93	93	12.8	S.C. BAYONET	H	1.20
L-120MB	120	120.0	MIN. BAYONET	A	1.20
L-130	130	6.3	MIN. BAYONET	A	.59
L-159	159	6.3	MIN. WEDGE	—	.59
L-219	219	6.3	MIN. BAYONET	A	.99
L-222	222	2.25	MIN. SCREW	F	.49
L-327	327	28.0	MIDGET FLANGE	J	.59
L-328	328	6.0	MIDGET FLANGE	J	.74

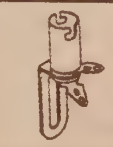
P/N	NO.	VOLTS	BASE	FIG.	PRICE
L-330	330	14.0	MIDGET FLANGE	J	.80
L-335	335	28.0	MIDGET SCREW	G	.80
L-345	345	6.0	MIDGET FLANGE	J	1.10
L-367	367	10.0	MIDGET FLANGE	J	1.10
L-370	370	18.0	MIDGET FLANGE	J	1.10
L-373	373	14.0	MIDGET SCREW	G	1.10
L-382	382	14.0	MIDGET FLANGE	J	1.10
L-387	387	28.0	MIDGET FLANGE	J	.60
L-1157	1157	12.8	D.C. INDEX	H	.60
L-1768	1768	6.0	MIDGET SCREW	G	1.10
L-1813	1813	14.4	MIN. BAYONET	D	.74
L-1815	1815	14.0	MIN. BAYONET	D	.99
L-1819	1819	28.0	MIN. BAYONET	D	.99
L-1847	1847	6.3	MIN. BAYONET	D	.65
L-1891	1891	14.0	MIN. BAYONET	D	.75
L-1892	1892	14.4	MIN. BAYONET	D	.75
L-1893	1893	14.0	MIN. BAYONET	D	.75



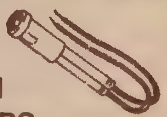
MINIATURE LAMP HOLDERS

Quality miniature lamp holder with universal mounting bracket. Available in miniature screw base and miniature bayonet base. Solder lugs.

LS-1
$2.40



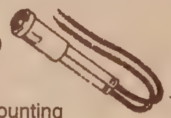
LS-2
$1.95



125 volt AC PANEL MOUNTED NEON INDICATOR LAMPS

A small diameter (0.34") neon indicator light that snaps into a 5/16" diameter mounting hole in panels from 1/32" to 1/16" thick. Nylon body with 5" PVC insulated wire leads

PART NO.	COLOR	PRICE
NL-1A	AMBER	2.19
NL-1G	GREEN	2.95
NL-1R	RED	2.19

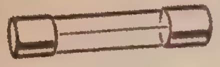


12 Volt PANEL MOUNTED INDICATOR LAMP

Mounts in 5/16" diameter mounting hole in panels up to .250" thick.
5" PVC wire leads.
12 volt lamp included.

PART NO.	COLOR	PRICE
PL-25A	AMBER	2.95
PL-25G	GREEN	2.95
PL-25R	RED	2.95

FUSES, HOLDERS, CIRCUIT BREAKERS, & LINE CORDS

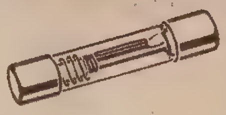


NORMAL BLOW

TYPE 3AG (AGC)
1 1/4" X 1/4" 250V

Fast acting type fuse for general circuit protection. Used generally in home radio, amplifiers, TV, etc.

PART NO.	AMPS	1-99	100+
FSC14	1/4	.22	.12
FSC12	1/2	.22	.12
FSC34	3/4	.22	.12
FSC1	1	.22	.12
FSC112	1 1/2	.22	.12
FSC2	2	.22	.12
FSC212	2 1/2	.22	.12
FSC3	3	.22	.12
FSC4	4	.22	.12
FSC5	5	.22	.12
FSC6	6	.22	.12
FSC7	7	.22	.12
FSC8	8	.22	.12
FSC10	10	.22	.12
FSC15	15	.22	.12
FSC20	20	.22	.12
FSC30	30	.22	.12



SLOW BLOW

TYPE 3AG (MDL)
1 1/4" X 1/4"
1/10A to 8A 250V
10A to 30A 32V

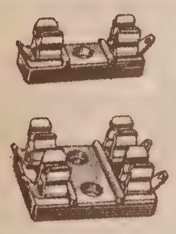
PART NO.	AMPS	1-99	100+
FSM14	1/4	1.55	1.25
FSMO12	1/2	.65	.50
FSM34	3/4	.65	.50
FSM1	1	.65	.50
FSM114	1 1/4	.65	.50
FSM2	2	.65	.50
FSM212	2 1/2	.65	.50
FSM3	3	.65	.50
FSM312	3 1/2	.65	.50
FSM4	4	.65	.50
FSM5	5	.65	.50
FSM6	6	.65	.50
FSM7	7	.65	.50
FSM8	8	.65	.50
FSM10	10	.95	.85
FSM15	15	.95	.85
FSM20	20	.95	.85
FSM30	30	.95	.85

5 X 20MM MINI FAST ACTING

1/16A to 3A 250V 3 1/2A to 15A 125V

PART NO.	AMPS	1-99	100+
FS116	1/16	1.45	1.20
FS110	1/10	1.45	1.20
FS18	1/8	1.45	1.20
FS14	1/4	1.45	1.20
FS12	1/2	.40	.25
FS710	7/10	.40	.25
FS34	3/4	.40	.25
FS1	1	.40	.25
FS112	1 1/2	.40	.25
FS2	2	.40	.25
FS212	2 1/2	.40	.25
FS3	3	.40	.25
FS312	3 1/2	.40	.25
FS4	4	.40	.25
FS5	5	.40	.25
FS6	6	.40	.25
FS7	7	.85	.71
FS8	8	.60	.45
FS10	10	.60	.45
FS15	15	.60	.45

FUSE HOLDERS

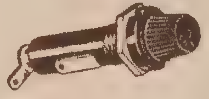


Will accommodate the 3AG cartridge type auto fuse. Clips are made of spring brass, and mounting board is made of 1/8" XP laminated phenolic insulating material.

FH108A............ 1 pole $1.00
FH108B............ 2 pole $1.25

PANEL MOUNT FUSE HOLDER

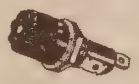
For 1 1/4" x 1/4' Fuses
Mounts in 1/2" hole 1 1/4" deep behind panel.
UL listed.



FH90-783 ... $1.50

PANEL MOUNT FUSE HOLDER

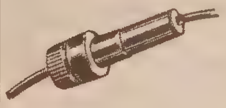
For 5 X 20MM Fuses
Screw type.



FH4413 ...... $3.49

INLINE FUSE HOLDER

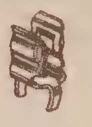
For all Fuses
5/8" to 1 1/4".
18GA lead wire.



FH4418 ..... $1.60

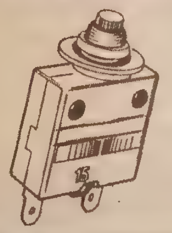
FUSE CLIP

For 1/4" 3AG type fuse.
Used for mounting to printed circuit board.



FH4425 ...... $ .25

CIRCUIT BREAKERS

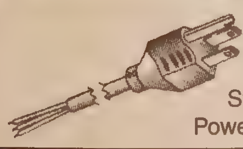


GENERAL INFORMATION

B7000 Series are single pole, thermal circuit breakers that features a recessed reset button which cannot be manually pulled out to disconnect the circuit. When an overload occurs and the breakers open, it allows the reset button to 'pop out' for visible trip indication. UL Approved.
Operationg Voltage 50VDC, 250VAC

PART NO.	AMPS	PRICE	PART NO.	AMPS	PRICE
B7003	3	3.40	B7010	10	3.40
B7004	4	3.40	B7012	12	3.40
B7005	5	3.40	B7015	15	3.40
B7006	6	3.40	B7020	20	3.40
B7007	7	3.40	B7025	25	3.40
B7008	8	3.40	B7030	30	3.40

LINE CORDS



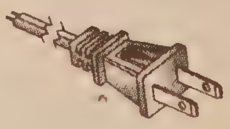
3 WIRE LINE CORDS

Type SJT Cord Sets
Standard NEMA 5-15P
Power plug, UL Approved.

PART NO.	WIRE GUAGE	LENGTH	PRICE
ACL166	16	6'	2.80
ACL169	16	9'	3.90
ACL186	18	6'	2.40
ACL189	18	9'	3.50

2-PRONG LINE CORD

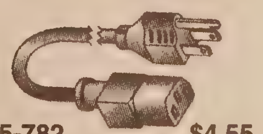
18GA. wire 7 foot long
Color: Black.



ACL27 .... $1.40

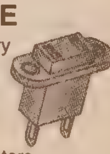
3-PRONG AC COMPUTER CABLE

Has AC plug on one end and computer plug on other.
18GA 6'. Color: Black



55-782 .... $4.55

CONVENIENCE RECEPTACLE



Suitable for accessory equipment power outlets on amplifiers, pre-amplifiers, clock radios chassis, etc.
1 1/16" mounting centers.
Requires a 13/16" x 7/16" retangular cutout. UL Approved.

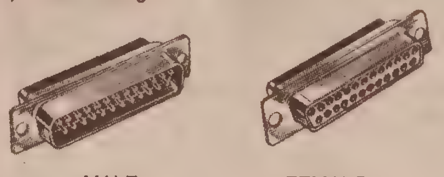
R118J .... $ .75

D-SUB, LOCKING AND TV CONNECTORS

D-SUBMINIATURE CONNECTORS

SOLDER TYPE

Solder cup contacts are tinned for positive soldering of wire. Contact areas are gold plated. Steel shell with glass-fiber reinforced plastic insulators (UL94V-0) 5 AMP Rating.



PART NO.	CONTACTS	GENDER	PRICE 1-99	100+
DS9M	9	MALE	.30	.25
DS9F	9	FEMALE	.32	.27
DS15M	15	MALE	.39	.32
DS15F	15	FEMALE	.45	.37
DS25M	25	MALE	.44	.37
DS25F	25	FEMALE	.46	.38
DS37M	37	MALE	.97	.80
DS37F	37	FEMALE	.94	.77
DS50M	50	MALE	2.19	1.82
DS50F	50	FEMALE	2.10	1.74

D-SUBMINIATURE HOODS

Available in standard plastic, diecast, and with captive thumbscrews. Includes hardware.

PART NO.	CONTACTS	MATERIAL	PRICE 1-99	100+
DE9	9	PLASTIC	.30	.25
DE15	15	PLASTIC	.36	.30
DE25	25	PLASTIC	.37	.32
DE37	37	PLASTIC	.63	.57
DE50	50	PLASTIC	.99	.83
DZ9	9	DIECAST	1.59	1.31
DZ15	15	DIECAST	1.99	1.65
DZ25	25	DIECAST	2.20	1.82

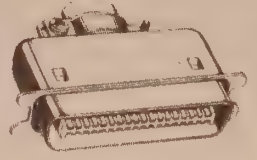
CAPTIVE THUMBSCREW

(BLACK PLASTIC)
HARDWARE INCLUDED

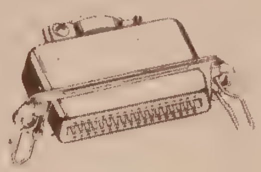
PART NO.	CONTACTS	PRICE 1-99	100+
DT9	9	1.00	.83
DT15	15	1.06	.87
DT25	25	1.18	.97

CENTRONICS 36 PIN CONNECTORS

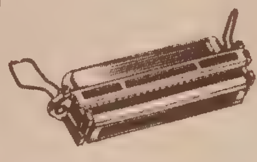
Connectors are mounted in plated steel hood with cable clamp and rubber strain relief. Gold plated contacts are attached to insulated material.



36 PIN MALE CABLE MOUNT
CPC36 $1.59



36 PIN FEMALE CABLE MOUNT
Flanges have spring latches.
CJC36 $2.42



36 PIN FEMALE CHASSIS MOUNT
Flanges have spring latches.
CJP36 $2.09

LOCKING CONNECTORS

SPECIFICATIONS:

Voltage Rating:
250V AC, DC

Current Rating:
5A AC, DC

Withstand Voltage:
1000V AC/minute

Insulation Resistance:
1000m ohm Minute

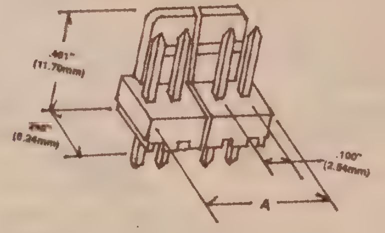
Temperature Range:
-25°C - +85°C

Applicable PC Board thickness: .063" (1.6mm)

Contact resistance:
Initial Value/10ohms Max.
After environmental testing/20m ohms max.

Material:
Post — Brass/Tin Plate
Base — Nylon 66, UL 94V-2

LOCKING POLARIZED HEADS .100" CENTERS



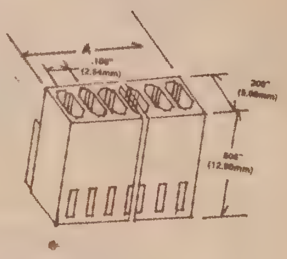
PART NO	POSITION	DIMENSIONS WIDTH	(mm) -A	PRICE EACH
70-4802	2	.200"	(5.08)	.24
70-4804	4	.400"	(10.16)	.27
70-4806	6	.600"	(15.24)	.33
70-4808	8	.800"	(20.32)	.36
70-4810	10	1.000"	(25.40)	.42
70-4812	12	1.200"	(30.48)	.45

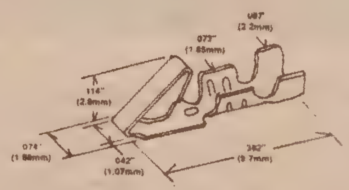
CRIMP TYPE LOCKING CONNECTORS

.100" CENTERS

PART NO	POSI-TION	DIMENSIONS WIDTH	(mm) -A	PRICE EACH
70-4852	2	.220"	(5.60)	.40
70-4854	4	.421"	(10.70)	.44
70-4856	6	.622"	(15.80)	.52
70-4858	8	.819"	(20.80)	.60
70-4860	10	1.020"	(25.90)	.64
70-4862	12	1.220"	(31.00)	.68

Mates with 70-4802 thru 70-4812





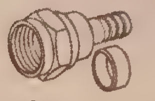
CRIMP CONTACTS

FOR ABOVE
22-30 GAUGE WIRE

70-4800 ...... 25 PACK ... $1.40
70-4800P ... 100 PACK . $2.60

TV ACCESSORIES

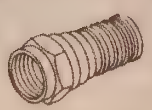
"F" CONNECTORS



1/4" crimping ring, tin plated brass.

FC65 ..... RG59U .... .17
FC56 ...... RG6U ..... .19

FOIL SHIELD CRIMP-ON "F" CONNECTORS.

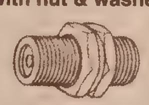


Suitable for all wires but a longer crimping ferrule is meant especially for cables with a foil type shield.

NO.	CABLE TYPE	PRICE EACH
FC57	RG59/U	.22
FC57A	RG6/U	.22
FC84	RG6 Tri-shield	.24
FC86	RG6 Teflon/Plenum	.24
FC88	RG6/U Quad Sheild	.24
FC90	RG59 Tri-shield	.24
FC92	RG59 Teflon/Plenum	.24

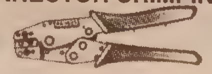
3/4" INLINE SPLICE (F81)

(with nut & washer)



FC67 .... $.24

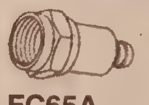
CONNECTOR CRIMPING TOOL



Designed for coaxial fittings on RG59U, RG62U, and RG6U. Made of tempered steel with insulated grip handle 8" long.

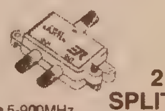
12-170 .... $6.95

"F" CONNECTORS



Crimp type attached ring tin plated brass

FC65A .... RG59U .... .17
FC56A ..... RG6U ..... .19

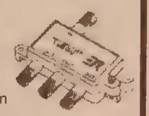


2 WAY SPLITTER

- 5-900MHz
- 3.5db insertion loss
- 20db isolation
- DC Passive

11-4120 .... $1.20

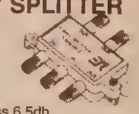
3 WAY SPLITTER



- Loss
  2 @ 6.5db-
  1 @ 3.5db
- 5-900 MHz
- 20db isolation
- DC Passive

11-4130 .... $1.60

4 WAY SPLITTER



- 5-900 MHz
- Insertion loss 6.5db
- 300db isolation
- DC Passive

11-4140 .... $1.80

AUDIO-TRANSFORMERS, SPEAKERS & ACCESSORIES

MINI AUDIO TRANSFORMERS

Ideally suited and selected for building or replacement of transistorized equipment. High vacuum impregnation, application of a special coating seals the coils. A special core of hydrogen heat-treated alloy is used. Size 3/4" x 5/8" x 5/8".

CAT. NO.	TYPE	PRIMARY OHMS	PRIMARY DC RES.	SECONDARY OHMS	SECONDARY DC RES.	PRICE
45-700	Input	100,000	2K	1000	70Ω	5.95
45-701	Output	1200	60Ω	3.2	.4Ω	5.95
45-703	Mike Input	200,000	2.26K	1000	43Ω	5.95
45-705	Input	20,000	320Ω	1000	230Ω	4.90
45-707	Driver	10,000	700Ω	2000 C.T.	127Ω	4.50
45-709	Output	500 C.T,	34Ω	3.2	.6Ω	4.50
45-711	Output	1000 C.T.	53.1Ω	8	.57Ω	4.25
45-715	Input	500Ω	34Ω	50Ω	3.17KΩ	5.35

Same as above except sub-miniature, type. Size 1/2" x 1/2" x 1/2".

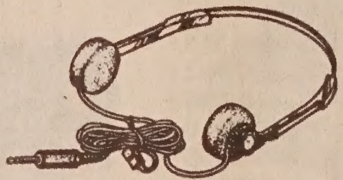
CAT. NO.	TYPE	PRIMARY OHMS	PRIMARY DC RES.	SECONDARY OHMS	SECONDARY DC RES.	PRICE
45-702	Input	100,000	1K	1000	110Ω	5.95
45-704	Output	500 C.T.	35.5Ω	3.2	.4Ω	4.25
45-706	Input	200,000	1.6K	1000	118Ω	4.50
45-708	Driver	10,000	736Ω	2000 C.T.	173Ω	4.25
45-710	Output	500C.T.	32Ω	8	2Ω	3.55

MINI TRANSISTOR AUDIO TRANSPORMERS FOR PRINTED CIRCUIT BOARD MOUNTING

Ideally suited and selected for building or replacement of transistorized equipment. High vacuum impregnation and application of a special coating seals the coils. A special core of hydrogen heat treated alloy is used to give high quality at a low cost. Dimensions 3/4" x 5/8" x 5/8".

CAT. NO.	TYPE	PRIMARY OHMS	PRIMARY DC RES.	SECONDARY OHMS	SECONDARY DC RES.	PRICE
45-712	Driver	10,000	400Ω	2000 C.T.	100Ω	2.20
45-713	Output	500 C.T,	30Ω	3.2	.4Ω	2.20
45-714	Output	1000 C.T.	45Ω	8	.47Ω	2.45

WALKMAN STYLE MINI STEREO HEADPHONE



Ultra Lightweight, less than 2 oz. yet high performance. Excellent replacement for most portable players. Frequency response 20-20 khz. Impedance 4-32 ohms. Sensitivity 100 db @ 1000 hz. 4 foot cord w/3.5mm stereo plug.

15-145A **Straight Plug** **$5.95**
15-145ART **Right Angle Plug** **$5.95**

4" UNIVERSAL REPLACEMENT SPEAKER

Heavy duty ceramic type magnet. Impedance 8 ohms, 5 watts.

TS50 Square **$3.95**

6" STANDARD REPLACEMENT SPEAKER

3 oz. ceramic magnet. 8 ohms Impedance, 10 watts.

TS60 Rounded Square **$4.25**

ELECTRET CONDENSER MICROPHONE ELEMENTS

Miniature in size, excellent quality. Working voltage range from 2-10 Vdc. Has many uses such as general replacement, recording devices, surveillance work, etc.

10-83 (3/8" dia.)... **2 pin, P.C. Mt. + Case Tab.** **2.25**
10-84 (3/8" dia.)... **3 pin, P.C. Mt. + Case Tab. Bal. Line** **2.25**

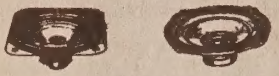
MICROPHONE ELEMENT

15/16" dia. 7/16" Deep high quality dynamic element, Ferrite magenet. Impedance 500 ohm. Frequency response 50-15,000 cps.

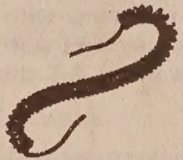
10-49 .... **$5.50**

MINIATURE PM SPEAKERS

Designed for miniature equipment. Amazing tone quality in a small size speaker for transistor and all sub-miniature applications. Precision made, ideally suited for pocket radio, small amplifiers and most transistorized equipment. Paper cones. (Imp.–8ohms)



P/N	DESCRIPTION		PRICE
20-225	1 1/2" Speaker–Square	1" deep	2.25
20-225R	1 1/2" Speaker–Round	1" deep	2.00
20-226	2" Speaker–Round	1" deep	2.00
20-227	2 1/4" Speaker–Round	1" deep	2.00
20-228	2 1/2" Speaker–Round	1" deep	2.00
20-229	2 3/4" Speaker–Round	1" deep	2.10
20-247	3" Speaker–Round	1" deep	2.55
20-2475	3" Speaker–Square	1" deep	2.55

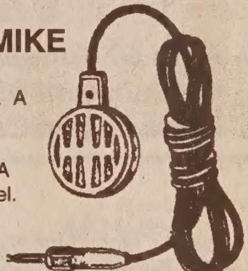


MIKE RETRACTABLE COIL CORD

Excellent for CB, Ham or general replacement use.
3 conductors plus 1 shield.
6 1/2 foot long extended

10-50 .... **$1.90**

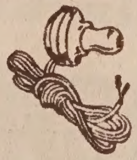
LAPEL CRYSTAL MIKE



A low-priced replacement mike for PA Amplifiers, Cassettes and Open Reel Portable Tape Recorders. A sensitive high impedance cartridge reproduces crisp clean sounds. Supplied with 3-ft. shielded cable tha terminates in a molded mini (1/6" dia.) phone plug. A clip is provided to assure firm attachment on the lapel.

Frequency Response: 70-8,000 Hz
Sensitivity: 50dB
Size: 1 1/2" dia x 1/2"

LCM101S **$5.96**

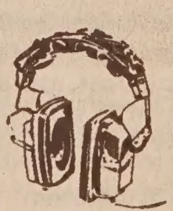


CRYSTAL EARPHONES

Crystal Earphones have a very high impedance for a variety of receiving & listening applications. All have molded plastic shell and plastic covered metal ear supports.

PART NO.	TERMINATION	CORD LENGTH	PRICE
CE747	Mini (1/8") Phone Plug	7'	4.75
CE748	Stripped and Tinned	3'	3.95
CE749	Std. (1/4") Phone Plug	8'	4.35

DYNAMIC STEREO-MONAURAL HEADPHONE



Expertly styled, well padded headband and earphones for snug, comfortable fit. Finely finished in black color. Stereo/Mono switching with individual volume control on each phone for perfect balance.

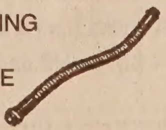
SPECIFICATIONS:

Frequency Response: 20-18,000 Hz
Impedance 8 ohms
cable 10 ft. spiral 3 cond. w/pig
Sensitivity 115 dB at 1 Hz 1 mW

15-135 .... **$13.50**

MICROPHONE GOOSENECK

5/8" - 27 CONNECTING
THREAD
MALE TO FEMALE
ON ENDS



10-36-6 .... 6" 4.50
10-36-13 .... 13" 5.85
10-36-19 .... 19" 7.15

STEREO TURNTABLE & AUDIO ACCESSORIES

Automatic Stereo Turntable — Break out the vinyl!!

- **Fully automatic operation**
- **2 speeds - 33-1/3 and 45 rpm**
- **Professional aluminum platter**
- **Switchable pre-amp**
- **Integral Dual Magnet™ stereo cartridge with replaceable stylus**
- **Balanced tone arm with soft damping control**
- **Easily-accessible front controls**

Audio-Technica AT-PL5

The AT-PL50 is a high quality stereo turntable with fully automatic operation. It features an efficient belt-driven system with convenient front mounted controls, and comes complete with an A-T dual Magnet phono cartridge.

Audio-Technica has been a leading manufacturer of innovative stereo phonograph products for more than 40 years. We are please to provide this turntable with its excellent performance and many convenient features.

AT-PL50 Specifications

Type	Belt drive turntable, fully automatic
Platter	Aluminum
Motor	DC servo-controlled
Speeds	33-1/3 / 45 rpm
Wow and Flutter	0.25% WRMS
Signal-to-noise Ratio	45 dB
Cartridge	Integral Dual Magnet™ stereo cartridge with diamond stylus
Output Level	
Preamp "Off"	2.5 mV nominal at 1 kHz, 5 cm/sec
Preamp "On"	200 mV nominal at 1 kHz, 5 cm/sec
Phono Preamp	Gain 38 dB nominal, RIAA equalized
Power	120V AC, 60 Hz, 3W
Dimensions	14.17" W x 3.82" H x 14.06" D 360 mm W x 97 mm H x 357 mm D
Net Weight	5.3 lbs. (2.4 kg)
Furnished Accessories	Stereo RCA-to-1/8" (3.5 mm) miniplug stereo adapter cable; 45 rpm adapter

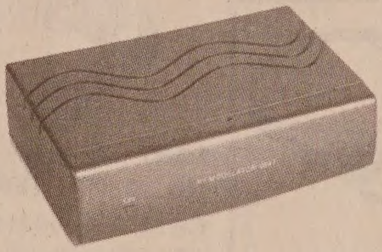
Replacement Stylus(needle) Available 211D6C
Replacement Cartridge Available AT3600L

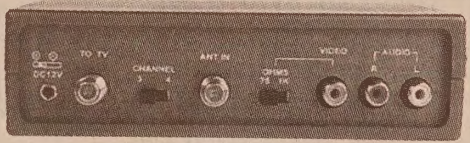
AT-PL50 Turntable	**$129.88**
Replacement Stylus #211D6C	**$13.88**
Replacement Cartridge AT3600L	**$19.78**

RF Modulator

This RF Modulator allows the user to connect a DVD Player, Digital Camera, Portable VCR, Satellite Receiver, Computer, Playstation, or other devices to a Televison or VCR without A/V inputs (seperate RCA jacks for Audio and Video). The Video RF Modulator is designed to convert the separate audio and video signals into a VHF TV Signal which can be viewed on a TV set on either Channel 3 or 4 (switchable).

Specifications:
RF Output Channels 3 or 4 switchable
Output Impedance 75 Ohms
Audio Input Impedance: Low impedance
Video Insertions Loss: -2dB
Complies with FCC part 15 rules
Connectors:
(2) F81 Jacks Video
(3) RCA Jacks (Stereo Audio and Video)
Dimensions" 5.83" x 3.0" x 1.46"





70-3007	**$24.88**

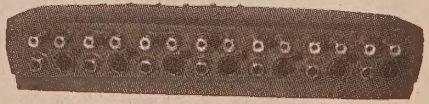
Audio/Video Selector Switch—Five Inputs / Two Output

This Audio/Video Selector can be used with Satellite Systems, VCR's, DVD Players, Laser Disc Players, Cable Boxes, Multimedia Speakers, Video Games, TV's, Computers, and much more. The possibilities are almost endless. The unit allows you to connect up to five (5) inputs to two devices, such as Televisions. They are equipped with both S-VHS Jacks (MD4) and RCA jacks for separate Audio and Video inputs. There is also an extra (front mounted) mini stereo jack for stereo headphones, or multimedia speakers. Don't be confused by competitors selling Four (4) Input / One (1) output devices. This is a true Five (5) / Two (2) device.

Specifications:
Inputs: Audio (5) Sets of RCA Jacks/Switch
Video (5) S-VHS Jacks (MD4 Female)
+1(1) RCA Jack/Switch
*S-VHS Jack is used for both Audio and Video
Outputs: Audio (2) Sets of RCA Jacks (Left & Right)
Video (2) RCA Jacks + (2) S-VHS Jacks

Frequency: 20-Hz to 10-Mhz
Insertion Loss Audio 1 db
Insertion Loss Video 1 db
Isolation 30db minimum
Dimensions: 9.65"W x 5.5"D x 1.9"H
Weight: 1Lb 7Oz

Front View

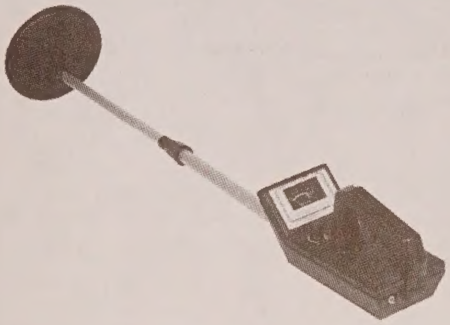


Back View

AV413C	**$41.75**

METAL DETECTORS

Finally, Metal Detectors you can afford. Discover the past with one of these fine Metal Detectors. Historical relics are waiting to be uncovered all throughout the world- starting in your backyard. These finds could range from interesting to extremely valuable. Metal Detecting has been an enjoyable and rewarding hobby for all ages for many years. There are thousands of websites devoted to this fascinating field. Metal Detectors also make great birthday and Christmas gifts.



Basic Metal Detector

Features

- Hunt for coins, relics, jewellery, gold and silver just about anywhere
- Headphones output
- VU-meter
- Waterproof search head
- Adjustable stem
- Power supply : 6 x 1.5V AA Batteries (not incl.)

Suggested Retail Price..$79.95
Model CS-100..Our Price $58.88

Metal Detector

Metal Detector with Audio Discriminator

Features

- Hunt for coins, relics, jewellery, gold and silver just about anywhere
- 3-tone audio discriminator
- Headphones output
- VU-meter
- Waterproof search head (8" Ø)
- Adjustable stem
- Power Supply: 3 x 9V Battery (not incl.)

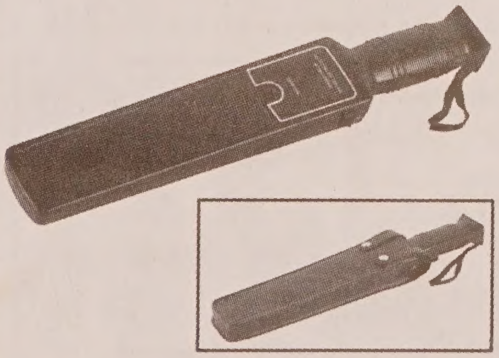
Suggested Retail Price...$119.95
Model CS-150...Our Price $97.88

Advanced Metal Detector with LCD Display

Features

- 7.9" waterproof search head
- Large LCD display
- Target ID
- Depth readout
- Sensitivity control
- Variable discrimination
- Variable notch
- 3-tone audio discrimination
- Low-battery indicator

Suggested Retail Price..$239.95
Model CS-200..Our Price $189.88



Hand-Held Metal Detector

The CS10MD is a high-quality hand-held metal detector designed to meet the requirements of the security industry. Typical applications include : body search for offensive weapons, airport and border security, checking parcels and letters for metal objects and searching anywhere that hidden metal needs to be detected.

Specifications

- power supply : 1 x 9V battery (not included)
- operating frequency : 22kHz
- operating current : < 50mA
- operating voltage : 7V to 9V
- operating temperature : 23°F to 131°F
- weight (net) : 9.9oz
- dimensions : 15.6" x 2.7" x 1.3"

CS10MD...$59.95

OCEAN STATE ELECTRONICS
P.O. BOX 1458
6 INDUSTRIAL DRIVE
WESTERLY, RI 02891

VISA MasterCard AMERICAN EXPRESS

www.oselectronics.com

ORDER TOLL FREE
1-800-866-6626

LOCAL/INQUIRIES
401-596-3080

24 HOUR FAX
401-596-3590

PRESORTED
STANDARD
U.S. POSTAGE PAID
WESTERLY, RI
PERMIT NO. 49

1934 OFFICIAL SHORTWAVE RADIO MANUAL

Edited by Hugo Gernsback. A high-quality reprint of Gernsback's 1934 "Complete Experimenter's Set-Building and Servicing Guide," including a "Full Directory of All Shortwave Receivers." Contains schematics of over one hundred different commercial recievers, along with a construction section showing how to build many early short wave recieving nd transmitting circuits. 260 pages.

21-4643 .... $15.95

NTE REPLACEMENT SEMICONDUCTORS

383,050 That's how many semiconductors NTE's 4000+ devices can cross reference. NTE replacement semiconductors provide a comprehensive line with parts backed by NTE's exclusive 2 year warranty. NTE is able to replace most obsolete, discontinued, and hard to find part numbers including JEDECC, Japanese, European, and many commercial and industrial house number types. NTE provides direct replacement for most devices offered by other solid state replacement guides including GE, RCA, SK, and Phillips. If you need one piece or a thousand, Ocean State and NTE can help. Visit our website at www.oselectronics.com to see our online NTE cross reference guide. NTE can also provide cross references to over 60,000 relays.

140/100 Watt Medium Duty Soldering Gun

Dual heating element for soldering a variety of materials. High wattage (140W) heats up to +950°F. Low wattage (100W) heats tip to +700°F. Pre-focused built in light illuminates work area. UL & CUL approved.

A soldering gun is ideal for making up UHF and N style connectors. A soldering iron just can't produce enough heat, resulting in a cold soldering joint.

SGJ-100 .... $18.87
SGT-104 Replacement Tip $3.87

NOVUS
Plastic Restorer Refinishing Kit

These Products will work on Plexiglass, Lexan, Lucit, UVEX, and Acrylites. Polish #1 will clear up most surface blemishes on radios, meter faces, etc. Polish #2 is for the truly bad situations. It actually removes damage instead of filling it. These polishes are free of any offensive odors and there is no toxic risk. The kit comes complete with handy polishing cloth. It's great for instrument faces, plexiglass windows, convertible rear windows, computer screens, copiers, safety goggles, motorcycle windows, and of course old plastic radios.

10300.....Complete kit #1, polish #2, & cloth.................$7.88
10301.....Polish #1...$3.69
10302.....Polish #2...$4.89

Head Magnifier's
Hands Free Use With Swivel Head

Basic Head Magnifier
Dual magnifications include both a single magnifying glass at 2.2X and a double magnifying glass at 3.3X. The unit easily adjusts to any head size and can be worn comfortably over glasses.
A wide range of uses from amateur users to professionals in all types of fields.

Model HM1149

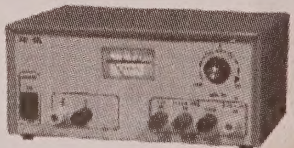
Deluxe Head Magnifier with Dual Light
As many as four different magnifications to choose from. You can adjust magnification from 1.1x - 4.8x depending on your needs. The loupe lens easily flips down or up in succession, quickly changing the magnification as your work demands. An additional flip down loupe over the right eye gives you additional magnification for detail work. The unit easily adjusts to any head size and can be worn comfortably over glasses. A wide range of uses from amateur users to professionals in all types of fields.

Model HM1150

These are the same head magnifiers you have see advertised for $30 to $40. A special purchase From the manufacturer allows us to offer them at our special low price.

HM1149.......Basic Head Magnifier.....................$7.88
HM1150.......Deluxe Head Magnifier with Light.....$9.88

Quad DC Variable Power Supply
FULLY REGULATED!



Load will have no effect on output voltage.
The variable Power Supply can be stacked for higher voltage outputs (24V max)
All four internal DC Power Modules are UL and CSA listed

Retail Price:..$59.95
Model XP-4A Our Price:...........................$39.95